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INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

Edited by

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ORIGINAL COMMUNICATIONS.

THE TREATMENT OF CHRONIC CERVICAL CATARRH.*

BY ALFRED HEINEBERG, P.D., M.D.,

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One of the most difficult problems in gynecology is the cure of chronic discharge from the cervix. A brief review of the methods of treatment advocated by various authors for the alleviation of this condition will in itself bear testimony to the unsatisfactory state in which the subject rests. The favorite method of one author meets only with condemnation in the teaching of another. One [1] strongly recommends direct applications to the cervical mucous membrane as the method of choice, while another [2] is just as positive that treatments should be confined to the use of glycerinated vaginal tampons without making any attempt at applying medicinal agents to the lining membrane of the cervix. Still another author [3] after discussing the pathology and symptomatology of cervical catarrh completely ignores any suggestions for treatment. This state of affairs leaves the physician with little or no experience in this line of work in a quandary as to which method to pursue, with the result that he tries first one and then another measure without giving any a thorough trial, and is ultimately disappointed with all.

Failure to obtain satisfactory results in the treatment of chronic cervical catarrh may be attributed not only to confusion in methods but to other causes. Chief among these is the failure to fully recognize the etiologic and complicating factors of the disease. Before treatment of any kind is instituted a careful and correct diagnosis should be made. Differentiation should be made between a local, circumscribed, uncomplicated pathological process in a limited area of mucous membrane and one which is only part of a general pelvic disease or the expression of a more general constitutional malady. The first offers hope of cure by simple measures, the other only temporary relief by methods of treatment which are directed solely to the cervix without regard for the associated lesions.

The causes of cervical discharge may be classified as follows:

Group I.

Constitutional	Anemia (chlorotic). Tuberculosis. Syphilis. Gout. Rheumatism.

Group II.

Conditions outside of the cervix which prevent the return of the cervical mucosa to its normal state	Displacements of the uterus. Chronic inflammation of the uterus, tubes, ovaries, pelvic peritoneum and connective tissue.

Group III.

Conditions outside of the cervix which reproduce the exciting cause	1. Bartholinitis. 2. Infection of Skene's ducts. 3. Pyosalpinx, with occasional discharge of pus into the uterus.

Group IV.

Conditions within the cervix	Infection. Erosion. Ectropion. Hypertrophy. Cystic degeneration.

Group I.—Chlorotic anemia and tuberculosis play an important rôle both in the causation and persistence of abnormal cervical discharges in young virgins. The thick, mucoid, or mucopurulent discharge from the cervix in such cases is an expres-

*Read before the Atlantic County Medical Society, March 8, 1918.

sion of a catarrhal, atonic state of the cervical mucous membrane, similar to that seen in the bronchial and gastric mucosæ in the same constitutional states.

The treatment should be directed more toward combating the underlying cause than to attempts at correcting the discharge with local applications to the cervix, especially since the latter are usually difficult and unsatisfactory.

Group II.—It should be thoroughly understood that the cervical catarrh which occurs in the presence of one or more conditions in this group is only a minor part of the existing pelvic pathology.

The changes which are found in the cervix in such cases are the result of long-continued congestion of the pelvic circulation produced by the other pelvic lesions. Failure to recognize or to correct the more important pathologic process, the initial cause of the cervical catarrh, will bring only disappointment in treatment of the discharge.

Group III.—The lesions in this group are more difficult of detection than those in the preceding. In the majority of instances they are due to gonorrheal infection. The persistent residence of the gonococcus in the vulvovaginal gland, or Skene's ducts, constitutes a menace to the entire genital tract. Reinfections of the cervical glands from time to time from these sources make the cure of the cervical catarrh almost impossible, until the other foci of infection are removed by appropriate treatment. A similar condition occurs in tubal infection in which the uterine ostium of the tube either remains patulous or opens at intervals and permits the escape of the tubal pus into the uterine and cervical canals.

Polak[4] has recently found "by making serial sections through the isthmian and interstitial portions of the tube in a large series of cases (of salpingitis and pyosalpinx) that the uterine end never closes and that the apparent occlusion in the isthmian and interstitial portion is relative and not actual."

I want to direct attention to another prolific cause of cervical discharge, one which I do not believe has received sufficient consideration, viz., curettage and the use of a Wylie or similar drain for the correction of acute anteflexion. It has been my experience that many cases after this treatment suffer from a persistent cervical discharge when none had been present prior to the operation; as a result of this observation I have abandoned the curette and the drain and find that my results are just as satisfactory from simple, thorough dilatation.

Group IV.—If all of the foregoing conditions which in one way or another contribute to the persistence of a cervical discharge can be excluded, or if the discharge continues after their correction, then, and only then, may local treatment of the cervix be expected to produce a cure. The pathological lesions of the cervix itself which produce persistent discharges of varying intensity are

Chronic catarrhal endocervicitis { Hyperplasia of the cervical mucosæ.

Erosion { Simple. Papillary. Glandular or follicular.

Ectropion.

Hypertrophy.

Cystic degeneration.

In the treatment of chronic endocervicitis it makes little difference whether the changes in the cervical mucous membrane be considered the result of infection or merely dependent upon a chronic pelvic congestion, provided the causative factor has been removed. The glands of the hyperplastic mucosa are found to be more tortuous, dilated, and frequently surrounded by inflammatory infiltration and lined with epithelial cells which secrete an abnormal amount of thick, tenacious mucus.

It is particularly in these uncomplicated cases of chronic cervical catarrh that the treatment which I am about to advocate gives the most gratifying results. When the changes in the mucosa and stroma of the cervix are complicated by bilateral laceration with consequent eversion of the lips and continuous exposure of the mucosa to the acid vaginal secretion and friction

against the vaginal walls, the treatment will not be as effective as in the cases not so complicated. The repair of the lacerations and restoration of the cervical canal are necessary to prevent further exposure of the mucous membrane to the sources of continued irritation and to permit it to resume its normal state.

Erosion of the cervix may be found in association with other lesions, especially chronic endocervicitis and ectropion.

Two theories are advanced for the formation of erosion. One is that they "are changes of the mucous membrane that cover the vaginal portion, consisting in exposure of the cylindrical epithelium after separation of the thick squamous epithelium which normally covers the structure."[5] The other is that "in cervical catarrh there is an extension of the cervical canal mucosa beyond the external os on to the vaginal portion of the cervix."[6]

"We distinguish simple erosion, with uniform, fairly smooth surface and without deep depressions; papillary erosion, in which the surface is irregularly nodular or marked by ridges with deep, regular depressions of glandular tissue into the vaginal portion; and follicular erosion, the entire surface of which, especially the peripheral portion, presents follicles in the form of yellow points or small cysts the size of lentils, which, when opened, discharge inspissated mucus or form small, roundish dimples, representing the remains of ruptured cysts."

Erosions usually disappear along with the correction of the underlying causative factor, especially chronic cervical catarrh and ectropion. The persistence of the cervical changes thus far considered usually results in either hypertrophy or the formation of retention cysts of Naboth. A moderate degree of hypertrophy requires no special attention. Marked enlargement demands reduction through amputation. When only a few cysts of Naboth present themselves either upon the mucous surface or beneath the squamous covering of the portio vaginalis their influence upon the cervical discharge is inconsiderable and may be overcome by puncture of the cyst and cauterization of its lining membrane with phenol or the electrocautery. When large areas of the cervix have undergone cystic degeneration nothing short of high amputation may be expected to have a satisfactory effect upon the discharge.

After we have paid attention to all conditions within and without the cervix which may be either etiologic or complicating factors of the cervical catarrh, and after we have corrected the extra-cervical causes by approved methods, we must consider what may be done to restore the cervical mucosa to a healthy state and decrease the discharge to a minimum. The employment in hundreds of cases in hospital and private practice of glycerin tampons alone as advocated by Bandler, or of direct applications to the cervix as advocated by Kelly and as ordinarily carried out, has convinced me that neither method of treatment gives entirely satisfactory results in the majority of cases. Of the two measures, if used alone, and by the usual process, I believe the glycerin tampons to be the more efficient. But results from glycerin tampons are not as satisfactory as those obtained by direct applications to the cervix, provided the applications are properly made. It is the method of making applications that I want to particularly describe. The secret of success lies in the preparation of the cervical mucous membrane for the reception of the medicating agent. We know that the cervical canal in health contains a plug of clear, tenacious mucus. In pathologic conditions the cervical secretion is increased in quantity and becomes thick, cloudy, muco-purulent, and still more tenacious. Most of the medicinal agents, such as silver nitrate, phenol, or the organic silver compounds, which are used in the treatment of diseased mucous membranes coagulate mucus as soon as they come in contact with it. The resulting dense wall of coagulum acts as a barrier to the access of the medicinal agent to the mucous membrane and nullifies whatever effect it might

have. Complete removal of the secretion cannot be effected by swabbing with cotton or gauze, or by the use of a suction apparatus, and these methods when persisted in frequently cause bleeding which still further counteracts the action of the medicament.

After experimenting with different methods, I have found that the cervical discharge can be easily and thoroughly dislodged by irrigation of the cervical canal with a weak alkaline solution of the following formula:

Sodii bicarb.,
Sodii chlorid.,
Sodii borat., equal parts.
Dissolving 1 drachm in 1 pint of water.

The syringe which I use for the purpose consists of a silver Eustachian catheter attached to a 10-Cc. Luer syringe by means of an adapter. The advantage of the silver catheter is that it is malleable and may be easily bent to accommodate itself to the direction of the cervical canal. The tip of the catheter is introduced well into the cervical canal and the fluid expelled from the syringe under sufficient pressure to dislodge the mucus. Several syringefuls may be necessary. There is not much likelihood of forcing the solution into the uterine cavity, unless the internal os is dilated or too much force is employed. Before beginning the treatment the condition of the internal os should be determined with a thin sterile probe. If it is found to be much dilated, as it rarely is, the alkaline solution should be applied on cotton-wrapped applicators instead of by irrigation. When the cervical mucous membrane is entirely clean it should be thoroughly dried with absorbent cotton and is then ready for the application of the medicating agent. I find no drug is as beneficial as silver nitrate.

In the aggravated cases of long standing, in which the mucosa is greatly thickened and erosion extensive, I begin the treatment with a 50-per-cent solution, applied every three or four days. The first few applications are apt to cause bleeding from the eroded surface. As the discharge lessens in amount and becomes thinner and less purulent, the strength of the solution is gradually decreased to as weak as 10 per cent.

If the cervix is large and boggy, I supplement the applications of the silver nitrate with boroglycerin applied on wool tampons until the cervix is reduced in size. It is most gratifying to observe the changes which take place in the erosion under this treatment. It gradually decreases in area through substitution of stratified squamous for the thin columnal epithelium. The change can be well seen at the edges where the ingrowth of squamous epithelium radiates toward the external os. In addition there are frequently seen islands of squamous epithelium in the center of the erosion, looking very much like small skin-grafts on a granulating surface. The patient is given a prescription for the alkaline powder with directions to use one tablespoonful in two quarts of warm water as a vaginal douche once or twice a day, depending upon the amount of the discharge. One distinct advantage of this treatment is that it lessens the necessity for extensive amputation of the cervix. I find that the cases of bad erosion and ectropion which were formerly subjected to high amputation in order to get rid of the diseased tissue, require after the treatment only trachelorrhaphy or a moderate amputation, if any at all.

I appreciate that there will be many who will scoff at and criticize this plan of treatment as a twice-told tale. It differs, however, essentially from all others in the method of preparation of the cervix for the application of the active medicinal agent. Furthermore, I have employed it in a sufficient number of cases to be certain of the claims made for it.

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NOTES ON THE MEDICAL TREATMENT OF ULCER OF THE DUODENUM.

BY CHARLES GREENE CUMSTON, B.S., M.D.,

Privat-docent at the University of Geneva; Honorary Member of the Surgical Society of Belgium; Fellow of the Royal Society of Medicine of London, etc., Geneva, Switzerland.

Early in practice as an abdominal surgeon, the writer commenced the study of the medical aspects of lesions of the abdominal viscera, being under the belief that the soundest surgical judgment is that one which decides when a given case offers fair prospects for recovery by means other than an operation. The medical treatment of many so-called surgical cases is unquestionably thoroughly neglected by a large percentage of operators, and after a quarter of a century of surgery I am more than ever convinced that many needless operations have been performed, much to the detriment of certain patients.

The treatment outlined in these brief remarks is simply that which I have essayed in cases of ulcer of the duodenum when it appeared that there was some reasonable hope that the lesion might be cured by medical treatment, and in some instances the efforts in this direction have been fruitful.

It will be assumed that the reader is quite familiar with the pathology, symptomatology, and complications arising in this lesion, and, therefore, my remarks shall be confined to the prophylactic treatment, the curative treatment of the fully developed ulcer, likewise the therapeutic indications considered from the view-point of the disposition of the ulcer toward regression and cicatrization.

Ulcer of the duodenum is a serious affection, and as soon as the diagnosis is made it should be seriously treated. There is no doubt in my mind that during the simple form of the process, that is to say, when the ulcer is in its early stage, medical treatment may be successful.

The first really good clinical study of duodenal ulcer is due to Bucquoy, who published his paper in 1887, but all credit is due to American surgeons, who demonstrated the hitherto unsuspected frequency of this lesion and laid down the rules for rational surgical treatment. The American clinicians also described the symptomatology in greater detail, particularly the peculiar characteristics of the pain to which the process gives rise. The distinction between the purely duodenal ulcer and that of the duodeno-pyloric seems to me quite proper, the former giving rise to Bucquoy's symptomatic triad, the latter to Reichmann's syndrome. Intermediary forms unquestionably exist, and the higher up the ulcer is located the more the pyloric syndrome will become manifest.

It is no easy matter to distinguish an ulcer seated on the duodenal side of the pylorus from one located on the gastric side. Even anatomically, the diagnosis is difficult, as the course followed by the pyloric vein is very variable. However, the all-important point is whether or not pyloric spasm exists, rather than the exact site of the ulcer. In *simple cases* a medical treatment should be first essayed, and if it fails, or if complications arise, then surgical treatment must be resorted to without delay. This is only logical, because the mortality of surgical interference when hemorrhage occurs may be conservatively put at 35 per cent, while the following figures may give a very accurate idea of the mortality for operations undertaken for perforation. Weir found that operation done within the first 12 hours the mortality was 39 per cent, during the second 12 hours 76 per cent, while cases operated on after the first 24 hours gave a mortality of 87 per cent. Citronblatt found that perforation operated on after the lapse of 24 hours gave a mortality of 50 per cent, while those operated on after 48 hours gave a mortality of 100 per cent. In a total of 29 cases Pagenstecher's general mortality was 85.7 per cent.

Having made these brief remarks I shall now enter upon the subject proper of this paper. One can hardly speak of a pro-

phylactic treatment of duodenal ulcer for the very simple reason that we are ignorant of the primal causal factors of the process. All that can be done is to eliminate those factors which experience has led us to assume are probably the provocative agents, and first and foremost of these is hyperacidity. Clinical case histories would likewise appear to indicate that alcohol is not a stranger in the production of duodenal ulcer, and therefore its use should be prohibited in all suspicious cases. These are about the only prophylactic measures that that can be recommended, and it is probable that a duodenal ulcer can only rarely be prevented by their adoption.

The division of the different stages of the process at which medical treatment is undertaken has been given by some as the hemorrhagic stage and the ulterior stages, which are the consequence of proper diet. Others have looked upon the hemorrhagic stage as the first in the process, representing the acute ulcer, and a second stage that of chronic ulcer, while a third stage is represented by the ensuing complications.

It seems to me simpler to divide the therapeutic indications into three stages, namely: (1) that of bleeding; (2) that of cicatricial formation; and (3) that of complete cicatrization.

In the bleeding stage absolute rest and immobilization of the organ must be maintained and all irritants coming from the stomach must be done away with. The patient must be kept in bed and absolutely quiet. He should not be allowed to raise himself, and feces and urine are to be voided in the bedpan. All callers are to be kept away in order to avoid any psychic emotion which might cause the hemorrhage to recur on account of an increased blood-pressure. A quiet, careful nurse must be selected for the case.

By the above means alone one may frequently cause the hemorrhage to stop in 24 or 48 hours, but if perfect rest cannot be obtained, the use of morphine or pantopon should be resorted to. I am of the opinion that opium by producing general tranquillity acts as a hemostatic, by aiding the formation of thrombi in the ulcerated area. Experimental work has shown that morphine somewhat excites the gastric and intestinal secretions, and therefore atropine should be given in order to counteract this tendency.

It is hardly necessary to say that all feeding by mouth must be stopped, rectal feeding alone being given. Most patients complain of rather severe thirst, but I think it is more prudent to desist from even cracked ice dissolved in the mouth for at least during the first 24 hours. The same applies to all medication per os.

If by the above treatment the hemorrhage is not controlled, some good preparation of ergot may be given subcutaneously or a subcutaneous injection of gelatin may be essayed:

> Gelatin. alb. steril., 0.60 centigramme;
> Aq. dest. steril., 100 Cc.;
> Sodii chlorid. puriss., 1 gramme.

Eighty to 100 Cc. of this gelatinous solution is heated to 38° C. and injected into the abdominal fat. The injection is usually painful, and by using sterilized gelatin the danger of tetanus is eliminated. A 2-per-cent solution of sterilized gelatin can be used subcutaneously, or 200 Cc. of a 5- to 10-per-cent solution may be given per rectum. Good results from gelatin per os are also obtained, a 5- to 10-per-cent solution being given hourly in the dose of one soupspoonful. The gelatin can also be dissolved in a 10-per-cent sugar solution, which is allowed to form a mass. This is given by teaspoonfuls according to indications.

Great faith was formerly had in ferrum sesquichlor., but its effect is uncertain and unsatisfactory, so that it is now rarely used. Adrenalin chloride in 1:1000 solution subcutaneously is of undoubted value, administered several times daily, or 30 drops by mouth has been recommended, but I have never been able to convince myself that it had any effect when given this way. On the other hand, when added to a physiologic salt solution for subcutaneous use its happy

effect is evident, because in cases of hemorrhage with collapse it brings the patient round by raising the blood-pressure.

An aluminum-glycerin paste has been recently advocated by G. Klemperer in hemorrhage from gastric or duodenal ulcer. It is given per os after the stomach has been flushed out, but I have had no personal experience with the new remedy.

Another treatment for severe duodenal hemorrhage which I cannot recommend is that advised by Ewald, Boas, and other Germans. It is irrigation of the stomach with ice-water. They first anesthetize the throat with cocaine and then introduce the tube as far as the cardia. Then 300 Cc. of ice-water under pressure is introduced.

Other writers have recommended gastric irrigations with water as hot as can be borne. Both these procedures are supposed to act by producing a reflex constriction of the vessels, but all this is too theoretical when one desires to obtain a prompt result.

Rectal injections of from 10 to 20 Cc. 5-per-cent solution of calcium chloride may be employed with some success, and from several years' experience I can warmly recommend the intravenous injection of several Cc. of a hypertonic salt solution. Morphine, pantopon, or codeine phosphate must be resorted to in good doses if there is pain, and repeated as often as required.

If the hemorrhage is so severe that the patient's life is in danger, direct transfusion of blood should be made, and if this is successful the abdomen may be opened as soon as the patient is in fit condition for an operation.

If the hemorrhage has been controlled by some of the above treatments, and fortunately this is the case in the majority of instances, our next duty is to direct our attention to maintaining the formation of thrombi and thus sustain the tendency to cure of the ulcer. Therefore, in otherwise strong subjects with a good general condition and cardiac action, all feeding, even per rectum, should be omitted for at least 24 hours after the loss of blood has ceased.

Feeding is then begun with nutritive enemata, of which I desire to speak somewhat at length, because to my mind the subject is important and frequently not well understood by the attending physician and nurse. Feeding by subcutaneous injections with various forms of hydrocarbons, albumin, and fats has been amply tried and proven to be both useless and not devoid of danger, while the necessary technique is very complicated, not to say difficult.

Nutritive enemata cannot maintain nutrition for any extended length of time. In order that the body shall profit by rectal nutrition the number of calories must attain at least 400, and Boyd and Robertson are of the opinion that the maximum should reach 655. Now, if we recall that an adult weighing 150 pounds requires from 2300 to 2500 calories, it at once becomes evident that the best of rectal feeding is very insufficient.

I do not think that any importance should be attributed to the fact that nutritive enemata stimulated the secretion of the gastric juice, as has been pointed out by Bourger, Winternitz, and others, because the amount excreted is very small. Although the caloric value of nutritive enemata in general is very small, the introduction of water they contain is of great importance, because a subject will be much more likely to die from thirst than from hunger. This is unquestionably a well founded fact, because Pasteur was able to keep a patient with duodenal ulcer on simple water enemata for three weeks without great detriment to his health. It should also be recalled that in cases of starvation the loss of weight is represented by 66 per cent of the body fluids and 33 per cent of fats and albumin. But in practice the necessity of rectal feeding in the cure of gastric or duodenal ulcer is paramount, and although the patients may lose considerably in weight, this is of no importance as they rapidly regain the loss when they return to feeding per os.

As is the case in ordinary diet, rectal feeding must contain a proper mixture of

the most important foodstuffs, represented by albumin, fats, and carbohydrates. Since the power of rectal absorption varies with each of these various substances, certain modifications in the composition of the feedings must be made in order to render them valuable. Common sense leads me to say that there is no hard and fast rule to be made in the composition of the enemata, and the physician should be guided by the varying daily condition offered by all patients.

For instance, if the subject is greatly weakened from loss of blood or from previous inability to take food on account of pain, an analeptic effect should be sought for by the use of broth and wine enemata. If the case requires a large quantity of fluids, 1500 Cc. or more of physiological salt solution should be given, and after a hemorrhage from the ulcer I know of nothing better than gelatin enemata (1 per cent) given at the rate of 150 Cc. several times in 24 hours.

As to the albuminous substances to be given in rectal feeding, they should be those products of digestive transformation of albumin, namely, the peptones and albumoses, as they are better adapted for absorption. It is undoubtedly true that the utilizable amount of peptone is restricted, because the introduction of from 50 to 60 grammes will set up an inflammatory reaction of the rectal mucosa, with premature expulsion of the enema.

The native albuminous substances contained in raw eggs have been found to be of most value. Their absorption can be somewhat facilitated by the addition of table salt at the rate of about 1 gramme per egg, but they are inferior in this respect to peptones. This difficulty of absorption restricts the use of egg enemata, while the processes of putrefaction in the gut finally lead to irritation of the mucosa.

The addition of various antiferments, such as thymol 10 centigrammes, menthol 25 centigrammes, or acid salicylic in the same dose, is perfectly valueless; but I am inclined to place some reliance on ammonium fluoride, 20 centigrammes in 300 Cc. water, a dessertspoonful of which is added to the enema.

Just as with the absorption of egg-albumin, the absorption of milk casein is rather low, and I think that milk enemata are less valuable as far as their casein and fat content is concerned, while their real nutritive properties reside in their salt and sugar-of-milk content.

Starting from the supposition that peptonization of albumin is necessary in order to cause absorption of albuminous substances by the rectal mucosa, meat-pancreas enemata were advised over a quarter of a century ago, but have been more or less overlooked by our modern clinicians. Animal experiments have proved that by this means it is quite possible to obtain absorption of quite an amount of nitrogenized matter, and I have seen cases in which the patient was kept along quite well for three to four months on meat-pancreatic enemata. Their administration offers considerable difficulty, but they are well worth the trouble in some cases.

Of late an attempt has been made to introduce large quantities of milk-albumin into the body by enema, and it would appear that it is absorbed as such by the rectal mucosa. A preparation has been put upon the market under the name of Erepton at the instigation of Abderhalden, but it is probable that this product will benefit the pockets of its manufacturer more than the patient's nutrition.

Fats can be employed in only a limited extent for nutritive enemata, and experience has amply demonstrated that under the most favorable circumstances not more than 10 grammes of fat in emulsion can be made to absorb by the rectal mucosa. But if fat be mixed with fresh pancreatic gland a much larger quantity will be absorbed, the amount varying from 20 to 50 grammes. A good combination is cream 125 Cc., peptone sicc. 5 grammes, and pancreatin puriss. 5 grammes. An enema thus composed may be given twice in 24 hours.

A fact that may be of interest to Ameri-

can physicians is that the Geneva pharmacists tell me that the American pepsin and pancreatin as prepared by Parke, Davis & Co. is far superior to Merck's or other German makes, and that they endeavor to keep the former products in stock rather than those of German origin.

Researches on the nutritive value of hydrocarbons given per rectum are of comparatively recent date. I have found that a 10-per-cent solution of sugar is well tolerated and absorbed by the rectal mucosa, and that it can be continued for quite a long time without any untoward effect on the mucosa. I am quite certain that cane-sugar is absorbed by the rectal mucosa, and that the more concentrated solutions are better. I am also of the opinion that more is absorbed when given in fairly large amount than when smaller quantities are injected, although I am not at present prepared to be too affirmative on this point.

Starch can be absorbed, but only when it has undergone a transformation into sugar. The inversion of starch is partially obtained by saccharification by the intestinal juices, in part by the ferments given off by the bacterial flora of the intestine. Following this saccharification, which is a slow process, a starch enema will be absorbed by degrees, and for this reason it is probably better to use sugar instead of starch.

Even if one occasionally finds some glycosuria after a sugar enema, it is of no particular import. It occurs because absorption takes place by way of the inferior hemorrhoidal vein, with the result that the sugar does not reach the portal circulation. However, generally speaking, the sugar solution will reach the area of distribution of the superior and median hemorrhoidals and by them reaches the liver.

I fancy that of all the carbohydrates, dextrin is the better utilized. It forms a considerable percentage in the composition of certain children's foods now upon the market.

Alcohol is to be classed among easily absorbed substances, and I am in the habit of employing it in the form of some good Bordeaux wine in enemata. However, on account of its tendency to excite gastric secretion it is more prudent not to give it soon after hemorrhage has occurred unless it is wanted for an analeptic effect.

The best vehicle for the introduction per rectum of all nutritive substances is milk, as its absorption is usually easy, if too large a quantity is not introduced, and to increase absorption a good pinch of salt should be added.

It goes without saying that the absorption of nutrients per rectum can only be attained by proper regulation of the enemata, and the following rules are good guides in this respect: In the first place an enema should always be given through a soft catheter, which should never be introduced more than 6 to 8 centimeters into the rectum. High rectal enemata are neither practical nor necessary. Never give more than 300 Cc. at a time if, as in the treatment of duodenal ulcer, rectal feeding is to be kept up for some weeks, and three, or at the most four, enemata in twenty-four hours are sufficient.

The enema should be made into a thick liquid, free from any lumps, and be slowly introduced at the body temperature. The patient should be placed on the left side with the pelvis slightly elevated, but in a case of ulcer with hemorrhage the patient's position must not be changed. Each morning a cleansing enema of salt solution is to be given.

No fixed rules can be given as to the composition of the enemata and the physician must exercise his judgment as to the requirements of the given case, but I here append a few formulæ gathered from various sources which I have found useful, along with the approximate number of calories of each:

(1) Pepsin, 60 grammes;
Milk, 300 Cc.

(Represents about 300 to 450 calories.)

(2) Finely minced pancreas, 60 grammes;
Finely minced lean beef, 200 grammes.

(About 300 to 450 calories.)

(3) Cream, 1 pint;
Pepsin, sicc., 25 grammes;
Pancreatin, puriss., 5 grammes.

(4) Broth, 250 grammes;
Alcohol, 20 grammes;
Grape sugar, 40 grammes;
Yolks of two eggs;
Pinch of salt;
Mucilage gum arabic, 2 to 3 dessertspoonfuls.

(5) Milk, 300 grammes;
Eggs, No. 3;
Salt, 3 grammes;
Starch, 400 grammes.
(Represents about 550 calories.)

(6) Eggs, No. 2;
Pinch of starch;
Sol. grape sugar, 25%, 100 grammes;
Wineglassful of Bordeaux wine.
Pepsin, 1 teaspoonful.
(About 300 calories.)

(7) Milk, 250 Cc.;
Yolks of 2 eggs;
Pinch of salt;
Bordeaux wine,
Starch, ää dessertspoonful.
(About 300 calories.)

With care as to details, in most cases rectal feeding can be carried out as long as required, and in my experience it is rarely necessary that one is obliged to add a few drops of tinct. opii to the enema to control rectal irritability.

I now come to the second phase of treatment, namely, when it is supposed that the *ulcer is undergoing cicatrization.*

A fortnight or three weeks of rectal feeding without return of hemorrhage or other symptoms is usually the time necessary for rectal feeding, and after this feeding by mouth may be cautiously begun. If one is dealing with a case in which the ulcer appears to be assuming a chronic course a combination of rectal and feeding per os should be instituted. Rectal feeding is gradually withdrawn, giving two enemata per day, and finally one for another five days or a week, as feeding per os is gradually increased.

The treatment now becomes both dietetic and medicinal. At first an absolute milk diet should be ordered if the patient tolerates milk well, but this diet need not be kept up as long as in gastric ulcer. The site of the ulcer beyond the pylorus prevents it from being *constantly* irritated by food, because the duodenum is simply a passage for the gastric contents, and what is more, the integrity of the gastric mucosa allows a quicker return to solid food.

A milk diet should nevertheless be maintained for several weeks, 500 Cc. being given every three hours from 7 A.M. to 10 P.M. The milk should be *eaten* and not drunk—that is to say, it should be taken in sips so that twenty minutes will be necessary for consuming the 500 Cc. I think it is well to order a dessertspoonful of the ammonium fluoride solution already alluded to, to be taken in the middle of the feeding, to control fermentation.

After the feeding one may with advantage prescribe the following:

℞ Magnesii ust.,
Sodii bicarb.,
Cretæ præparat.,
Bismuth. subnit., ää 50 centigrammes.
For one powder.

Occasionally 5 milligrammes of codeine or one centigramme of pantopon may be added if indicated.

Then progressively the diet becomes one of eggs and milk, then lactovegetarian, and finally a mixed one. Begin with white fish cooked in water and without sauce; then scraped raw beef or ham may be added in small quantity in order to relieve the monotony of life. Broiled chicken, sweetbreads, and chicken can soon be given if all goes well.

For vegetables, finely mashed potatoes passed through a sieve, purée of spinach, rice, tapioca, or sago can be at first allowed, also a little white bread; but all spices, highly seasoned meats, cheese, or salad must be avoided. *Uncharged* alkaline water or milk should be used as drink, and after a time coffee may be permitted. Red wine diluted with water may be taken when the patient is well on the road to recovery.

The above is merely an outline of diet in duodenal ulcer and undoubtedly can be con-

siderably improved upon in many ways, but further details seem unnecessary.

In cases of duodenal ulcer coming under treatment in an early stage of their development, a cure can be wrought by diet, particularly if no complication has as yet arisen. Otherwise medicinal treatment is to be combined with the regimen above given.

Foremost among drugs are the alkalies, their excellent results being due to their reductive action on the secretion of the gastric juice. Hourly small doses of some alkaline, combined with pulv. rhubarb and either cane or milk sugar will quickly give rise to visible good effect. The rhubarb exercises a kindly action on the intestine, while the sugar calms the pain.

The alkalies may also be given during or after eating, the following formula being quite useful:

℞ Sodii bicarb.,
Magnesii ust., ää 10 grammes;
Sacchar. lactis, 15 grammes.

Div. in dos. æquo No. XV. S.: One powder after eating.

When indications call for it, powdered rhubarb can be added, particularly if a mild stimulation of the intestine is desired. I would also recall the prescription already given containing bicarbonate of soda, prepared chalk, etc.

Bouveret gives the bicarbonate in daily doses of 8 to 14 grammes, but when a large quantity of alkali is indicated I prefer to prescribe magnesia usta, as the sodii bicarb. is prone to give rise to carbonic acid.

The alkalies are also excellent in subduing the pain which is often so severe in duodenal and gastric ulcer, and if they alone are insufficient small doses of extract of belladonna can be added.

Much importance has been given to preparations of atropine, because not only do they act in controlling the secretions but they possess a mild narcotic effect as well. It has been shown that atropine causes all acid secretion to cease almost completely, and this is certainly one of the essential conditions for the cure of the ulcer. From ½ to 1½ milligrammes of atropine *pro die* can be given subcutaneously for a period of from two to three weeks. The same good effect can be obtained by suppositories of belladonna.

A rather lengthy absence of acidity may occasionally be observed following atropine treatment, but it finally disappears. Taboras has treated cases with daily doses of from 1 to 3 milligrammes of atropine for from four to ten weeks, combined with an abundant diet of cream and butter, and he has observed no serious ill effects from the alkaloid. Other than a disagreeable dryness of the mucosa and a slight paralysis of ocular accommodation no other untoward symptoms were noted. The pain from the ulcer rapidly subsided and in most of the cases did not recur.

Taboras thinks that if necessary larger doses of atropine could be given for the relief of pain, but in reply to this I would say that if a duodenal ulcer necessitates such an intensive treatment it had better be treated surgically. I would also add that eumydrin, which is not toxic, may be advantageously used in place of atropine.

In patients who cannot submit to as strict treatment by diet, etc., Boas recommends a systematic treatment with argent. nit. in solution, a treatment, I would add, that was advocated some thirty or more years ago by others not of the German school. I shall describe the treatment in a few words because Boas, whose opinion in gastric pathology I respect, seems to have obtained good results.

A soupspoonful of a solution of argentic nitrate, 25 centigrammes to 120 Cc. distilled water, is given when the stomach is empty, in a wineglass of water. The dose is progressively increased to 3 centigrammes in 120 Cc. aq. dest., the patient consuming two bottles, after which the dose is raised to 0.40:120, and according to indications one to two bottles are taken. After each daily dose of one soupspoonful the patient should rinse the mouth with a weak solu-

tion of table salt. The taste and occasional nausea are the disadvantages of the treatment, but a few drops of alcoholat. menth. pip. are said to control these favorably. Some men who have resorted to this treatment have been obliged to discontinue its use on account of disturbances in the intestinal functions. Personally, I have never had occasion to test its worth.

Another series of medicaments are employed, having for their object the coating of the ulcerated surface and thus protecting it against all external irritation, particularly the gastric juice. Among these agents bismuth is the foremost. This drug was introduced into therapeutics by Odier of Geneva as far back as 1786, and has maintained its place as an important drug ever since.

Bismuth subnitrate has been employed for duodenal ulcer as follows: The stomach is first washed out, after which from 10 to 20 grammes suspended in 200 Cc. tepid water are introduced by the tube. The tube is then clamped and withdrawn after the lapse of a few minutes, but before doing this the water of the bismuth solution is allowed to return, thus leaving the powder in the stomach.

This treatment should be carried out every two or three days, and is to be continued as long as may seem necessary.

Another manner is to give the patient 150 Cc. Vichy water upon arising in the morning, and thirty minutes later he is given 10 to 20 grammes of bismuth sublimate in hot water. This obviates the unpleasant process of the stomach tube and is quite as satisfactory.

I have resorted to the latter method upon several occasions with evident good results; but I have combined bismuth carbonate with bismuth subgallate ää 10 grammes, as the latter drug has appeared to me eminently fitted for obtaining the desired effect on the ulcer.

It has been supposed that the bismuth becomes mixed with the gastric mucus and that it thus forms a coating for the duodenal ulcer. However this may be, this treatment has been successful in the cases in which I have employed it.

Ewald has given the bismuth in combination with 50 centigrammes of orthoform, and this might be indicated in very irritable ulcers, although I have never met with a case in which it seemed necessary. It is quite remarkable how large a quantity of bismuth can be introduced into the body without the occurrence of intoxication, 300 to 400 grammes having been given over long periods of time without the slightest ill effect. By its use the pain is quickly suppressed and a decided tendency to healing results.

Some writers have maintained that the bismuth coating is injurious, inasmuch as it is the means of retaining the secretions of the ulcerated surface, thus increasing the necrotic process at the base of the ulcer. Theoretically this sounds reasonable, but practice does not substantiate it.

In cases of hemorrhage chalk and talcum have been advised in place of bismuth, as they do not color the feces and therefore the blood may be seen, but as the bismuth treatment should, according to my views, never be resorted to in the case of hemorrhage, I see no reason for advocating these drugs.

The difficult question of deciding when a duodenal ulcer has cicatrized cannot be solved with absolute accuracy. At all events, I am at a loss to be able to offer any sure guide in this respect. However, I believe that when all pain has vanished from the duodenal area when deep abdominal pressure is made, a fairly reasonable presumption of a cure may be suspected.

The absence of occult blood in the feces is of great importance, and if by *repeated examinations* no trace of blood is detected, I feel that there is some certainty that the ulcerative process has cicatrized, or at least is well-nigh there.

3, RUE BELLOT, GENEVA.

SOME NOTES ON CHENOPODIUM.

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Chenopodium is also known as American wormseed, Mexican tea, Spanish tea, Jesuit tea, Jerusalem tea, and Jerusalem oak. These terms are applied to the plant *Chenopodium anthelminticum* Linnæus, also known as *Chenopodium ambrosioides anthelminticum* A. Gray, a member of the Chenopodiaceæ or Goosefoot family of the order Chenopodiales. In the same genus is the ordinary lamb's-quarters, or pigweed, used as a food plant in this country and formerly so used by the Indians. Other species of this genus have been used in medicine as anthelmintics, antispasmodics, expectorants, emetics, emmenagogues, and in treatments for chorea. Chenopodium is said to have been naturalized in this country from tropical America, and to occur in waste places from New England to Florida and California. It is very common in Virginia, Maryland, the District of Columbia, Arkansas, and Florida, and is cultivated for the market in parts of Maryland, especially in Carroll county. Moillet and Carreno state that as "epazote," chenopodium is known almost all over Mexico.

The plant grows to a height of 2 to 3 feet (Brüning[1] says 2 to 5 feet, quoting an early Dispensatory) and may be distinguished by the odor of the volatile oil of chenopodium which is noticed when the leaves, stem, or seeds are crushed. According to Brüning, the plants yield 1.5 to 2 per cent of this oil. Keith[2] states of oil of chenopodium: "It is an ethereal oil obtained from an American plant resembling the cabbage." As chenopodium bears no resemblance to cabbage and belongs to a different order of plants, this statement appears to be based on misinformation. A recent statement in the *Boston Medical and Surgical Journal* (v. 175 (23), p. 438) to the effect that the principal sources of chenopodium are in the islands of Java and Sumatra and the Levant is probably based on a confusion of American chenopodium and the Levant santonica.

In anthelmintic medication, the bruised fruit has been given in doses of 20 grains in an electuary; or the expressed juice of the fresh plant used in tablespoonful doses; or the decoction made by boiling an ounce of the fresh plant in a pint of water given in 2-ounce doses; or the fluid extract given twice a day for three days in doses of from 15 minims to a drachm; or the oil of chenopodium derived from the plant by distillation has been given, according to various published reports, as follows:

With preliminary purgation with Epsom salts, and without preliminary purgation; in doses of 3 to 10 drops, 15 drops, 16 drops, 10 minims, 15 minims, 16 minims, 17 minims, 21 minims, 30 minims, and 0.22 mil to 1 mil, for adults; the dose is given once or repeated for a total of two or three doses; the interval between doses is a half-hour, an hour, two hours, four to five hours, and twenty-four hours; the oil is given in sugar, molasses, honey, milk, emulsion, capsules, or globules; it is followed by Epsom salts, Glauber's salts, castor oil, castor oil and chloroform, black draught, unspecified cathartics, or by no purgation whatever; the interval between the last dose of oil and the dose of purgative is usually two hours, sometimes four hours; the oil of chenopodium is occasionally combined with castor oil, chloroform, and oil of eucalyptus. Most writers advocate the use of three doses with a one- or two-hour interval between doses. It may be noted in passing that a minim and a drop of oil of chenopodium is not at all the same thing. A casual test with a pipette shows over two drops to the minim, a given number of minims, therefore, constituting more than double the dose of the

[1]Brüning, H.: *Zeits. f. Exper. Path. u. Therapie*, 1906, 3, pp. 564-587.

[2]Keith, R. D.: *J. Trop. Med. and Hyg.*, 1916, 11, pp. 130-131.

same number of drops. The maximum dose is that given by Keith—three doses of 30 minims each at hour intervals. Heiser [3] states in a discussion of Keith's paper that Keith gives 10 minims each morning for three mornings, and then follows the last dose with castor oil after a two-hour interval, but Heiser appears to have quoted Keith wrongly in this respect. The dose method attributed to Keith by Heiser has been recorded by Thornburg [4] and by Coutant,[5] the latter reporting a case of severe poisoning from this treatment. I regard this method of treatment, giving chenopodium every morning for three mornings with no purgation until the third day, as the worst of the methods so far proposed, for reasons already published by Hall and Foster [6]—*i.e.*, that oil of chenopodium is distinctly constipating and should be given with a purgative rather than left for two 24-hour intervals before purgation. Experimental work in this laboratory indicates that the prompt administration of castor oil has very distinct protective value against the irritant and toxic properties of oil of chenopodium, saving the lives of dogs that were given doses found to be lethal when given without castor oil, and it appears to be superior to any other purgative for use with oil of chenopodium. In numerous experiments we have found the administration of the oil of chenopodium in soft or elastic capsules to be the most satisfactory mode of administration. On the other hand, Darling, Barber and Hacker[7] found magnesium sulphate superior to castor oil in clinical experience, and did not obtain as satisfactory results from the soft capsules used by them as from hard capsules. This matter needs additional consideration, owing to differences in the composition of various makes of soft capsules and owing to the effect of the contained drug on the solubility of capsules of any given composition.

Millspaugh[8] states that chenopodium is said to have been used by the American Indians as a vermifuge and as a treatment for dysmenorrhea. Weeds that are notoriously bitter or pungent are very commonly regarded by primitive peoples as potent plants, either as drugs or for other purposes, and it is unlikely that such a highly and distinctively odorous plant as chenopodium would go uninvestigated. And it would only take a moderate amount of investigation, in all probability, to establish the potency and the particular value of chenopodium. Primitive peoples, children and persons of low mentality and little education are especially subject to infestation with parasites, this being a result of the unsanitary surroundings and habits common among those mentioned. Where infestations with such worms as ascarids are common, as was probably the case among the Indians, the connection between the ingestion of chenopodium and the passage of these large worms would not be hard to imagine or establish. Millspaugh states that the Indians also used spigelia (pinkroot), another native anthelmintic, before Columbus discovered America.

Following the Indian's use of chenopodium, there has been a long "wormseed tea" period, during which period this valuable anthelmintic was largely used as a home remedy on the farms and by the colored "mammies" of the South. At the same time our medical men very generally ignored this valuable anthelmintic and used imported, and in the main less effective, drugs. An appreciation of chenopodium, which began before the outbreak of the present war, has been intensified by the shortage of imported drugs since the war began, and at present chenopodium is being very largely used and is receiving an increasing amount of study and attention.

[3] Heiser, V. G.: *Journal A. M. A.*, Aug. 7, 1915, pp. 526-527.

[4] Thornburg: *Journal M. St. M. A.*, Feb., 1917.

[5] Coutant, A. F.: *Journal A. M. A.*, Nov. 25, 1916.

[6] Hall, M. C., and W. D. Foster: *Journal A. M. A.*, June 30, 1917, pp. 1961-1963.

[7] Darling, S. T., M. A. Barber, and H. P. Hacker: *Journal A. M. A.*, Feb. 23, 1918, pp. 499-507.

[8] Millspaugh, Chas. F.: Medicinal Plants, v. 2, 1892.

According to Nelson,[9] oil of chenopodium was first investigated by Garrigues in 1854 and reported as containing a hydrocarbon boiling at 176° C. and a liquid of the formula $C_{10}H_{16}O$. The same authority states that Schimmel & Company, by fractionating at reduced pressure (the oil exploding on attempted distillation at atmospheric pressure), separated a liquid, designated as ascaridol, which constitutes the major portion of the oil and to which the peculiar chemical and medicinal properties are due. Ascaridol is a yellow oil with the formula $C_{10}H_{16}O_2$. Nelson came to the conclusion that it was an unstable dioxide.

Investigations of the action of oil of chenopodium naturally follow two independent but correlated lines of work. One line is an investigation of its actual efficacy as an anthelmintic, since that is practically the only use of the drug; the other line is an investigation of the physiological action of the drug on the host animal, since anthelmintics are practically always poisonous to some extent,, and it is desirable that we know their incidental effects as well as the dose and mode of administration that will give adequate anthelmintic action with a minimum injurious effect on the host. This last line of investigation has been pursued by Salant and his collaborators in the U. S. Bureau of Chemistry for some years. Studies of the anthelmintic efficacy have been made by a number of physicians in this country and abroad with clinical findings as a basis, by Hall and Foster in the U. S. Bureau of Animal Industry, and by myself in this laboratory with animal experimentation as a basis. These experimental findings have been published in part in the preliminary note by Hall and Foster and will be given in detail in subsequent papers. The experiments indicate that in animals having a simple digestive tract, as in the case of man and the carnivora, oil of chenopodium is more effective against such worms as ascarids than any other anthelmintic now in use.

[9]Nelson, E. K.: *Bu. Chem. Circ.*, 73, 1911, pp. 1-10.

TREATMENT OF SCIATICA.

To the *Journal of the American Medical Association* of December 15, 1917, STRAUSS contributes a paper on this topic. He says that there are two methods which have yielded good results: One is the injection of physiologic sodium chloride solution into the neighborhood of the nerve according to the technique of Lange, and the other is the epidural injection along the lines described by Cathelin. In making perineural injections, the patient lies on the abdomen with a pillow underneath its lower part, and the feet projecting beyond the edge of the table or couch. A line is then drawn from the sacrococcygeal articulation to the lowest point of the posteroexternal border of the great trochanter. The point of puncture is one inch to the outer side of the junction of the inner one-third and outer two-thirds of the foregoing lines. A trocar and cannula about 20 cm. in length and 2 mm. in caliber is used in the injection. The point of the trocar ought not to project very far beyond the cannula. The needle is inserted and directed downward through the gluteal muscles until the nerve is reached. When the nerve is touched, the patient feels a sharp, shooting pain down the leg, and there is very often involuntary contraction of the gastrocnemius muscles. When the nerve is struck, the trocar is immediately withdrawn, and a syringe attached to the cannula. Physiologic sodium chloride solution is then injected in amounts varying from 100 to 150 Cc. Considerable pressure is sometimes necessary in order to force the fluid into the tissues, and in such cases care must be taken that the needle is not forced into the nerve. Considerable pain may follow the injection, which as a rule subsides after an hour.

It may be necessary to repeat the injection every other day until at least five are given, but as a rule three injections suffice. Alcohol should never be used for these injections.

The epidural space in an adult begins at the lower edge of the first sacral vertebra,

where the dura ends. It extends down to the sacrococcygeal articulation. At this level the injections are made. There are certain landmarks by which this opening, the foramen sacrale superius, may be identified. It lies at the end of the crest made by the spines of the sacrum. It has the shape of an inverted V or U, and is about 1 cm. wide and 1.5 to 2 cm. in length. It is bordered laterally by two prominences, the cristæ sacrales laterales, which are usually easily felt by the finger. The opening is covered by a dense fibrous ligament, the ligamentum sacrococcygeum. The opening lies generally 2 cm. above the end of the gluteal fold.

The needle used for the injection should be about 8 cm. in length, and 1 mm. in caliber. Strauss has used an ordinary steel needle previously tested as to its flexibility. If greater flexibility is desired, a needle made of platinum iridium may be used; but a broken needle need cause no alarm; it will do no harm if allowed to remain in the epidural space. The needle is to be inserted to a depth of 6 cm. to reach the second sacral vertebra. There is no danger of entering the subarachnoid space, because the dura ends at about the level of the first sacral vertebra; however, to be certain that this space has not been entered, it is well to wait for a few minutes before injecting to see whether there is an escape of cerebrospinal fluid. If possible, when inserting the needle, one should place the patient in the knee-chest position in order to more easily locate the landmarks. If the injection is made with the patient lying on the side with the knees and thighs flexed, the landmarks are not so easily discerned, and the gluteal fold usually lies above the foramen. It may be difficult, if not impossible, to enter the epidural space, especially of stout women. In such cases recourse must be had to the nerve injection.

It has been Strauss' custom to anesthetize the skin and tissue overlying the foramen and the ligament with novocaine. In doing this, one must be careful not to cause much swelling, which might obliterate the landmarks. After the needle has been pushed through the skin, considerable resistance is met at the ligament. Once this resistance is overcome, the needle glides into the epidural space. If the patient is in the knee-chest posture, the needle is inserted into the body at an angle of 45 degrees. After it has passed through the ligament the needle is held so that it is horizontal to the body. During the injection the patient lies on the affected side.

The injection consists of warm sterile physiologic sodium chloride solution. To the first 10 or 20 Cc. of solution is added 0.125 gm. of novocaine with adrenalin, and a few minutes are allowed to elapse after their injection to obtain the full benefit of their anesthetic effect. In all, from 60 to 80 Cc. of solution are injected at a time.

The injections are given at forty-eight-hour intervals. They may be given in the office, and the patient will have no difficulty in going home. It is preferable, however, for the patient to remain in bed during the intervals. The average number of injections required is three. Occasionally it may be necessary to give five, but sometimes two or even one suffice to relieve the condition. The most difficult cases to cure are the chronic ones in which the pain is along the outer aspect of the thigh. In some instances this pain persists even after several injections, and then treating the limb with superheated air in the Tyrnauer apparatus is efficacious. The heat treatment alone in the subacute and chronic cases is of no avail. Massage ought never to be used—it appears to do more harm than good. A patient may improve after several epidural injections, but not be entirely cured. The injections of sodium chloride solution along the course of the nerve in the gluteal region may cause the disappearance of the pain. There have been no untoward results from the epidural injections. The knee-jerk on the affected side has disappeared for a short time, and sometimes the patient complains of delayed micturition.

EDITORIAL.

QUININE AND MALARIA.

The readers of the THERAPEUTIC GAZETTE will recall that in the last issue we published a leading article calling attention to a very interesting and valuable communication to the June issue of the *Journal of the Royal Army Medical Corps* by Thomson, who is a captain in that corps. At that time we stated it was our intention in a future article to deal with the latter part of his paper, which appeared in the July issue of this journal.

In this concluding part of his paper he emphasizes the fact, generally recognized, that, notwithstanding the antimalarial effect of salvarsan and neosalvarsan, quinine still remains the true specific in this infection, but he admits that it will not cure every case and states that no definite and infallible cure for all cases is yet known. There are a number of reasons for this. It is fundamentally essential in the cure of all infectious diseases that we should take into consideration the vital resistance of the patient, since this is an important factor in aiding remedial measures. All too frequently the general health of the patient in syphilis and in malaria is overlooked while we push to the utmost our specific remedies. If, however, a patient with malarial infection is feeble, or exhausted from any cause, the quinine may fail, as it may also in patients who have had recurrent infections with small doses of quinine which have served to produce immune strains of the parasite. Again, as Thomson points out, malarial infection in certain portions of the world seems to be much more resistant to quinine than others, entirely apart from the particular part of the organism which may produce the infection.

Possibly, the most important and essential point emphasized by Thomson is his deep-seated belief that nothing less than the continuous course of quinine, thirty grains daily given in solution by the mouth every day for three weeks, can be considered as a curative treatment. Smaller doses administered for a shorter time may seem to have produced a cure, both from the standpoint of the patient and from the examination of the blood, yet, if treatment is stopped at an earlier time, relapses all too frequently occur.

In connection with cases of malarial infection exhibiting pernicious symptoms such as coma and persistent vomiting, Thomson fully recognizes the importance of full doses of quinine and its administration by other means than by way of the mouth. He states that it should be given intravenously, intramuscularly, hypodermically, and by the rectum, and urges that in the presence of comatose symptoms the patient is likely to die if quinine in full doses is not administered. Thomson says that the prognosis in comatose cases depends almost entirely upon the duration of the coma before treatment is commenced, and claims that if the treatment is begun immediately after the onset of coma the chances of recovery are very good. In the Liverpool Hospital for Tropical Diseases all coma cases recovered except those which were admitted in a moribund condition and which had been comatose for twenty-four hours or longer. In this condition he recommends that the patient shall be surrounded by several hot-water bottles and blanketed in order to induce a sweat. He gives forty grains of the bihydrochloride in about four ounces of warm water by the rectum, injecting intramuscularly thirty grains of the same salt, and thoroughly massaging the part where the injection is made. This treatment is repeated at the end of twelve hours. He calls attention to the very good results obtained from intravenous injections by James in Panama, who used the bihydrochloride in normal saline in the dose of twenty-two grains in six to eight ounces of salt solution, administering it as is "606."

In this connection a contribution made to *La Presse Médicale* of August 2, 1917,

by Jeanselme and Dalimier is of very considerable interest. Using Tanret's reagent they have carefully studied the rate of elimination of the hydrochloride of quinine in the urine when given in the dose of fifteen grains. Given intravenously the quinine appears in the urine immediately, reaches its maximum rate of elimination in from four to six hours, and disappears in from twenty-four to thirty-six hours. When given in aqueous solution intramuscularly it appears in fifteen minutes, reaches its maximum in six hours, and ceases to be eliminated in fifty hours. Given by the mouth it appears in twenty-five minutes, reaches its maximum in five to six hours, and ceases to be eliminated in from twenty-eight to thirty-one hours.

In this connection we refer our readers to the leading article dealing with the intravenous injection of quinine, as practiced by surgeons in the U. S. Navy, to which we called attention in the issue of the THERAPEUTIC GAZETTE for August, 1917.

If active quinine medication is resorted to, it has been the experience of Thomson that the coma passes off about twenty-four hours after the beginning of the treatment. The stomach becomes retentive and, as soon as this occurs, quinine in solution may be administered by the mouth, thirty grains daily or in larger amounts. If the bowels are obstinately confined, he suggests that the comatose patient receive one to two drops of croton oil mixed in butter on the tongue, and wisely calls attention to the practical point that a rubber blanket should be put under such a patient. He believes that the condition of the bladder should be looked after, as urinary retention is not infrequent.

The condition of coma is believed by Thomson to be due to plugging of the smaller meningeal and cerebral blood-vessels, not only by an excessive number of parasites but by clumping of the red blood cells which contain parasites, which blood cells seem to develop a peculiar, sticky condition equivalent to agglutination, which prevents them from moving separately. Thomson thinks this embolic tendency is the cause of the petechial hemorrhages and the pernicious symptoms in general.

Several years ago we discussed in the THERAPEUTIC GAZETTE the contest between those physicians in India who are strongly in favor of intramuscular injection of quinine and those who are bitterly opposed to it. Those who are in favor of it claim that by this method we are sure that quinine gets into the body and is absorbed. Those who are opposed to it claim that the quinine is precipitated in the muscle and is very slowly absorbed, that it produces soreness, discomfort, and, more important than all, in some cases is productive of tetanus, even when the most careful aseptic procedures are followed, seemingly because the injection of the quinine induces a condition in which the wandering tetanus infection finds a peculiarly suitable field for growth. In Thomson's opinion intramuscular injections are not advisable. He claims that no paper advocating this method has been published which is based upon prolonged and careful scientific control, and gives us the information that at the present time some careful researches along this line are being carried out under the direction of Sir Ronald Ross. We think it may be fairly concluded at present that the intravenous method, when the mouth cannot be used, is the method of choice.

The single large dose method given with the hope of thorough eradication of the infection at one blow is faulty and possesses elements of discomfort and danger. For this reason it can be dismissed.

Thomson seems to be in favor of the administration of hydrobromide in dose of ten grains three times a day, as he seems to think that this salt does not produce as much cinchonism. The amount of hydrobromic acid present, however, seems to us too small to put aside cinchonism, and, if the patient is peculiarly susceptible, this disagreeable symptom had better be conquered by fairly full doses of bromide of sodium.

In connection with the matter of hema-

turia and hemoglobinuria Thomson is one of those who believe that quinine should be administered if the parasites are found in the blood. It will be recalled that many years ago we published a collective investigation upon this subject which showed that the medical profession in America seemed to be about equally divided, in those districts in which malarial hematuria was common, in regard to the question as to whether hematuria indicated or contraindicated the use of this drug, a small plurality being in favor of its use. This seems to be Thomson's view.

Under the heading of "The Inferiority of Other Drugs Compared with Quinine," Thomson gives a large amount of information which we have not space to include, save to state that nothing has been found which approaches it in efficiency.

Finally, he concludes with a very valuable scientific and clinical contribution to this subject in the following synopsis:

(*a*) In all cases, whether acute, chronic, or latent, and in cases of gamete carriers, commence a thorough routine treatment as early as possible with the idea of obtaining a permanent cure from the beginning. The treatment may be considered severe, but it pays, and it means that less quinine will be needed in the long run.

(*b*) As a rule early cases will be cured by a routine treatment of ten to fifteen grains of quinine in solution, by mouth, given three times daily for three weeks. When it is suspected, however, that the drug is not being absorbed well, due to gastritis or some other cause, then in addition to this oral routine, inject ten grains daily hypodermically or intramuscularly during, say, the first five and the last five days of this period. [This conclusion seems to contradict his statement quoted above.—ED.] It is advisable also to continue the treatment for two additional months with smaller doses (fifteen grains daily).

(*c*) In the case of resistant forms of the disease, or in cases which have relapsed several times in spite of thorough oral treatment, then give a course of intravenous injections.

(*d*) Always give small doses of liquor arsenicalis, as well as quinine, commencing with two minims t. i. d., and gradually increasing to five minims.

(*e*) Put all acute and subacute cases to bed, with hot-water bottles, and administer hot drinks to induce perspiration. Give also an initial dose of calomel followed by salts to clear out the bowels. During the paroxysm, aspirin or phenacetine may be given to relieve headache and to reduce the temperature. During the routine quinine treatment keep the patient in bed on a moderately light diet for the first week. Give a full diet and allow up during the second week. Allow out-of-doors if the weather is fine during the third week, but on no account allow any exposure or fatigue during treatment.

(*f*) In pernicious cases with coma or persistent vomiting, inject a considerable dose of quinine at once, at least thirty grains, and repeat this dose if necessary within twelve hours. After the pernicious symptoms have gone, continue with the usual routine treatment.

(*g*) In the event of a patient being markedly intolerant to quinine, give instead a three weeks' course of methylene blue in pill form, twelve grains daily, or try some of the other recent remedies.

(*h*) In the army, where it is required that men should be rendered available for work as quickly as possible, give thirty to forty grains daily for three weeks as early as possible. Discharge the patient as cured, and allow a short leave for hardening purposes. If it is found that this treatment is followed by a high percentage of relapses, then it may be necessary to develop some system whereby the men discharged from hospital can continue to take smaller doses of quinine for an additional two months while on duty.

(*i*) In blackwater fever cases, stop all quinine, administer diuretics, saline transfusions, and stimulants, give liquor arsen-

icalis, and later iron tonics. In future attacks of malaria in such subjects begin very cautiously with small doses of quinine.

THE DIAGNOSIS AND TREATMENT OF TUBERCULOSIS.

It is manifest that the title of this leading article is so broad in its scope that it might readily be applied to a contribution which would fill every page of the GAZETTE; nevertheless, the title is appropriate because in no other disease is the question of diagnosis and treatment so interdependent, and in no other disease is the future of the patient, both as to treatment and ultimate recovery, so largely dependent upon a correct diagnosis in its very earliest stages. When we use the word treatment it is not our intention to imply that drug treatment is essential; on the contrary, without doubt drug treatment in a majority of cases of early tuberculosis, and indeed late tuberculosis as well, has no effect whatever upon the disease itself, and recourse to it is justified only when the disease produces symptoms which, because of their severity, impair the vitality and happiness of the patient. The pathology of a tuberculous process renders it difficult for any drug which might have a destructive effect upon the tubercle bacillus to attack this microorganism. The only chance of the patient is that by vital resistance and excellent general health, the processes of the body, which are apparently multiple and not single, may win out in a battle which is necessarily quite prolonged. Unfortunately, many early cases of tuberculosis fail to be recognized because the physician simply considers that the patient is run down from overwork and indoor pursuits and is content to administer tonics and laxatives when, if he were more minute as to the details of his examination, he might discover some tuberculous focus in its incipiency which was really responsible for the fag and exhaustion which the patient presents.

Again, it is unfortunate that in the earliest stages of tuberculosis there are practically no physical signs or symptoms which are definitely pathognomonic. While, on the one hand, many cases of this disease have been allowed to progress very far because of carelessness in examination, on the other hand a comparatively limited number of medical men have become so possessed with the idea that all subacute or chronic physical signs in the lungs are due to tuberculosis that they frequently make such a diagnosis and unduly alarm both the patient and his friends when another cause than the tubercle bacillus is responsible for the physical signs presented by the patient. To overlook early signs which should arouse suspicion, or be recognized as typical, is a most serious delinquency, but to make a mistake in the diagnosis of tuberculosis when it is not present often causes an amount of mental suffering and produces a change in a man's life and career which is terrible to contemplate.

Perhaps the most common omission which is committed by the examining physician, in his attempt to reach a diagnosis by one examination, is his failure to insist upon the patient keeping a record of his morning and evening temperature over a considerable period of time. While is is true that text-books of physiology state that a temperature of 99.5° may be considered normal toward the latter part of the day, nevertheless such temperatures, or those amounting to 100°, are to be regarded with suspicion, particularly if they constantly recur each afternoon or evening, and it is important to note that in some patients the temperature when taken between 4 and 6 P.M. will be found to be higher than normal, whereas if it is taken at bedtime it will be at the point at which it was in the morning. Therefore, if the morning and bedtime record shows no marked variation, it is well in suspected cases to order an afternoon temperature instead of a night temperature. That physicians commonly ignore the importance of taking regular temperatures is well shown in a paper recently published in the *Boston Medical and Surgical Journal*

by Lyman, who makes the statement that out of 1940 physicians consulted by one thousand patients who presented themselves at Gaylord Farm Sanatorium only 13.4 per cent saw fit to take the temperature even once.

Another point which is of very considerable value is the presence of persistent rapid pulse, particularly if it is associated with loss of weight, loss of strength, and, still more, with cough, or with symptoms of general impairment of health, which the ignorant patient and careless physician were prone some years ago to ascribe to "latent malaria."

Some years ago we pointed out that prolongation of expiration at the apices, with some tendency to tubular breathing, and slight impairment of resonance on percussion, while without doubt physical signs which are characteristic of early pulmonary tuberculosis, are, nevertheless, also present in lungs which have, at some time in the near or remote past, suffered from pneumonia or marked pleuritic adhesions. These physical signs are also found in patients who comparatively recently have suffered from influenza and by themselves should not, in the majority of cases, lead to a diagnosis of pulmonary tuberculosis. If, however, they are associated with the other symptoms or signs of which we have just spoken the probability of the condition being due to this particular infection becomes almost a certainty.

The bearing of these diagnostic points upon the matter of treatment is manifest, and we have already pointed out how utterly futile is the treatment of tuberculosis by drugs. The patient who has early tuberculosis, if he is a dweller in a city, should, above all things, be sent from the city to pure country air where constant reinfection will not occur, and if possible to a climate where the air does not contain so much moisture as to be humid and exhausting in summer, or to rob the respiratory tract of an excess of heat in winter, whereby catarrhal conditions are induced and the processes of vital resistance in the body in general, and in the lung in particular, are impaired. The use of the hypophosphites and lactophosphates with the idea that they will provide lime salts which will be deposited by the body in, or about, the tuberculous foci has been shown to be futile, any benefit which occurs usually being produced by the bitter substances, or the iron or arsenic, which are associated with them. The administration of cod-liver oil with the idea that it has a curative influence in this disease is one of the worst mistakes of which the profession has been guilty, in part because, when cod-liver oil was most popular, we had a very limited knowledge of the causes and pathology of the disease. Beefsteak and potatoes are infinitely more valuable to the tuberculous patient than cod-liver oil, and the administration of this oil, or any other oil, with the idea of fattening the patient, all too frequently results in disorder of his digestion and impairs his appetite for the very articles of food which would have been most valuable to him. Good food, fresh air, pure air, sunshine, arsenic, and, if anemia is present, small doses of iron, not sufficiently large to disorder the stomach or induce constipation, are measures which should be instituted in the early stages of the disease.

Lastly, it is not out of place to quote the words of Dr. Hawes in his book on Early Pulmonary Tuberculosis, to wit: "Were the stethoscope used less and the thermometer and common sense used more, there would be fewer mistakes."

SOMETHING MORE OF IMPORTANCE ABOUT ALCOHOL.

At the last meeting of the American Medical Association the House of Delegates passed a series of resolutions to the effect that alcohol had no value as a food or as a drug, and, at that time, the writer of this article sent a letter of protest to the *Journal of the American Medical Association* pointing out that the food value of alcohol had been well established by all reputable scien-

tific investigators and that a very large number of medical practitioners believe that, when properly used, it possesses definite powers as a remedial agent. In this letter of protest statements were quoted from leading works and authorities on pharmacology which took a strong stand along these lines, and it is very probable that had more time been given to the consideration of this important question less radical statements would have appeared.

Again, in the protest to which we refer, it was pointed out that during these wartimes it is vitally important that medical men, because of their training, should be looked to for advice which in value is unassailable, and that they should represent the well-balanced portion of the community rather than those who are ultra-radical or ultra-conservative.

It is of vital importance that the moral aspect of the abuse of alcohol shall always be carefully separated from its employment as a drug. This moral aspect can be dealt with with more or less accuracy by the public in general, but the medical side of the matter can only be properly debated and decided by those who have medical training and who are sufficiently judicial in mind to make a clear separation between moral and medical questions.

That alcohol is a drug, and a powerful one at that, no one will deny, and we think it is a statement that also cannot be controverted that any drug which possesses power, if properly used, is capable of doing good. It begins to look as if the war against alcohol as a beverage might result in its complete overthrow, and while such an overthrow may result in much benefit to those who are so constituted that they cannot use it properly, it may also result in depriving those who need it, as a medicine, of something which is really of service to them when ordered by a physician.

Without any intention of entering into the bitter controversy which has raged about this subject for many years from the moral aspect, we think that our readers will be interested in the conclusions which have recently been arrived at by the Central Control Board of England, a special department set up to deal with liquor traffic under the Defence of the Realm Act. The *Lancet* of March 2 points out that the success which has attended its operation has been due in the main to the fact that, unlike previous efforts to deal with the questions involved, the policy of the Board has not been framed to fit the conceptions of prejudice or enthusiasm.

Formal and explicit evidence of this characteristic has now been given by the publication, under official auspices, of a study of the physiological action of alcohol. This work, which is essentially a review of the existing state of knowledge on the subject, has been prepared by the Advisory Committee appointed by the Control Board in November, 1916, the chairman of this Advisory Committee being Lord D'Abernon, the other members being Sir George Newman, M.D., Professor A. R. Cushny, Dr. H. H. Dale, Dr. M. Greenwood, Dr. W. McDougall, Dr. F. W. Mott, Professor C. H. Sherrington, and Dr. W. C. Sullivan. Many of these men are familiar to all medical men throughout the world as representing the highest possible standards.

As the *Lancet* points out, their work is a statement of our ignorance as much as of our knowledge, and this adds largely to its educational value, inasmuch as nothing has contributed more to the confusion of opinion in regard to the drink problem than the perpetual promulgation of views and theories based on erroneous or inadequate data. Again, the *Lancet* well points out that the work deals effectively with the old and futile question, "Is alcohol a food or a poison?" The committee has dealt effectively with the fallacies underlying this mode of stating the case, and has drawn up a series of conclusions which are designed to determine in what precise sense can alcohol be described as a food and under what conditions it acts as a poison. To these questions the committee gives replies as positive and definite as the present state of scientific knowledge permits, which are as follows:

1. Alcohol is undoubtedly a food, in the sense that its combustion in the body can

supply a considerable part of the energy needed by the organism.

[It is for this reason that alcohol is useful in many cases of exhausting fevers since it is readily oxidized and the increased combustion processes of fever burn it up more readily than in health.—ED.]

2. Unlike other foodstuffs, it cannot be stored in the system in altered form, to be used as required, but remains as alcohol in the blood and the tissues, on which, if present in excessive amount and over prolonged periods of time, it exercises a deleterious influence.

3. By reason of this latter characteristic alcohol cannot safely be used as a large element in the diet without risk of injury to health, and it is on this account, and also because of its disturbing effect on nervous functions, quite unsuitable as a staple food for industrial workers.

4. Its action on the nervous system, which is the chief *raison d'être* of the ordinary use of the alcoholic beverages, in health and in disease is, with the possible exception of its effect on the respiratory center, essentially narcotic and not stimulant.

5. The moderate use of alcohol by the average normal adult is physiologically unobjectionable, provided that it is limited to the consumption of beverages of adequate dilution, taken at sufficient intervals of time to prevent a persistent deleterious action on the tissues.

These conclusions furnish a solid basis for the discussion of the wider issues of the drink question, and, with the *Lancet*, we are glad to learn that this work is in progress and that the committee is already in possession of the results of experimental investigations concerning such questions as the effect of dilution on the action of alcohol and the difference in inebriating effects between beer, wines, and spirits. Every one in this country and in England will, we think, be interested in the further publications of this important group of British students and investigators.

As we have repeatedly pointed out, the question of the use of alcohol by healthy persons is as widely separated from its use by certain people who are ill as it is possible for two questions to be. It will be unfortunate if in the effort to prevent the abuse of alcohol as a beverage legislation results which will prevent its use as a remedy, the more so as whisky, brandy, gin, and other preparations possess certain properties which ordinary alcohol does not.

TRANSFUSION.

It will be remembered that Dr. Crile in his addresses on "War Surgery," based on experience at the front, stated that practically the only really serviceable treatment for the betterment of the conditions incident to the low blood-pressure of profound shock was the introduction of fresh blood into the circulation. He and many other observers have shown the transitory effects of intravenous injections of normal salt solution, the futility of camphor, the uselessness of either hypodermoclysis or enteroclysis, the detrimental effect of strychnine, when the circulation is profoundly depressed; the great service of heat, rest, elevation of the foot of the bed, and pressure over the abdomen, supplemented by deep breathing.

Concerning transfusion in war-times there is no difficulty in finding donors; the slightly wounded are cheerful and generous givers.

From the standpoint of transfusion all people are grouped under four headings: 8 per cent in Group 1, 40 per cent in Group 2, 10 per cent in Group 3, and 42 per cent in Group 4. The one important consideration in the choice of the donor is that his corpuscles should not be agglutinated or hemolyzed by the serum of the recipient. Even though the donor's serum may on small quantity test agglutinate and hemolyze the patient's red corpuscles, this is not an absolute contraindication to the use of such blood since the quantity injected is not sufficient to do serious harm.

Under Group 1 are classed patients whose serum will neither agglutinate nor hemolyze any donor's red corpuscles. The red cor-

puscles of this group are agglutinated and hemolyzed by the serum of all other groups. A person in Group 1 can receive blood from any one, but he can give it only to a member of his own group. He is the universal receiver, the single group giver. A person of Group 4 is neither agglutinized nor hemolyzed by the blood from any group, but his serum agglutinizes and hemolyzes all groups except his own. Hence he is called (Lee, *British Medical Journal*, Nov. 24, 1917) the universal donor, and if he has been previously classified his blood safely can be taken without further test for any one. But he can safely receive blood only from a member of his own group.

The minimum test required is that the patient's serum does not agglutinate the donor's cells. This can be determined as follows: A cubic centimeter of blood is drawn from the one who is to receive the blood, allowed to clot, and the serum is obtained. One drop of this serum is placed upon a slide and mixed with a drop of a suspension of blood of the donor made by letting one drop of this fall into 1 Cc. of a 1.5-per-cent citrate solution. The blood must be dropped directly into the citrate solution and not allowed to clot. The phenomenon will appear in a few moments. It is examined under the microscope or it can be seen macroscopically. In the negative test it is a wise precaution to raise the cover-glass, and after making sure that the serum and cells are well mixed, to examine the preparation again. The only possible source of confusion is rouleaux of the red corpuscles, indicating a too thick emulsion. This may be avoided by seeing that the blood of the donor is diluted with at least ten times its bulk of citrate solution.

Lee in base hospital work keeps constantly on hand a supply of serum to be known as Groups 2, 3, and 4. As soon as persons known to belong to Groups 2 and 3 have been ascertained—for example, among the medical officers or laboratory attendants—it is possible to determine the blood group of any particular individual very readily, and these known persons, or test persons, can act as a supply of the known serums. If it is known that any individual is in either Group 2 or 3, all the other groups can be established. By using the serum of Groups 2 and 3 one has only to collect the blood of the person to be tested in citrate solution, and the test can be performed immediately. If the serum of unknown blood is tested against the known cells, it is necessary to await the development of serum after clotting. In case the blood of a known group is not available it is only necessary to test out a series of bloods against each other. The serum, if sterile, can be kept indefinitely. In actual hospital work, since sudden severe hemorrhages often happen at night a transfusion may be called for without further delay. A certain number of donors belonging to the fourth group are selected, and transfusion is practiced without testing the patient's blood.

It has been repeatedly demonstrated that without tests fatalities occur and that severe reactions are frequent. The author states that in the condition he has set down, and after considerable experience, he has seen no disastrous effects from transfusion and no evidence of hemolysis as indicated by the appearance of jaundice or hemoglobin in the urine, even when permissible cross-transfusions were performed repeatedly upon the same patient.

THE ARMY MEDICAL MUSEUMS.

Through the foresight, scientific knowledge and indefatigable enthusiasm of a small group of persons the Army Medical Museum was established and holds within walls which are bursting with quantity and richness of material a collection beyond price.

The opportunity is now offered incident to the casualties and diseases consequent upon our present war of so adding to this collection that it may be without a rival in the scientific world. Plans adequate for all probable expansion, and characterized by

supreme architectural skill in so far as dignity and beauty of exterior are concerned, have been formulated, but there the matter stops. The budget for this important work is $5000 a year. There is no appropriation for the collection or forwarding of specimens, or, even were these matters attended to, there is no proper place for their reception, classification, and exhibiting.

From a very brief inspection of the present Museum collection of specimens illustrating military, medical and surgical practices of the Civil War, including the weapons used, it is obvious that a similar record of our present conflict would be of inestimable value. Nor with the exception of the new building, which is absolutely essential, does this imply a large expense.

In a brief article on this subject Shufeldt (*Medical Record,* Oct. 20, 1917) notes that as our fighting force becomes available for service the field hospitals, operating tables, dead and wounded on the fields of battle, general hospitals here and abroad, will soon be furnishing the material that results from operations of many, many kinds. The enemy's weapons, of every conceivable description, will soon be captured by our troops at the front; new methods for transporting the wounded are already in operation—indeed, all this, with much else besides of the greatest possible value to our physicians and surgeons of the future, in civil as well as in military life, needs to be cared for immediately, and proper accommodations of a permanent character made for it in Washington. As many reports as possible of medical officers at the various seats of war should be accompanied by the removed parts at operations, when of especial interest. There should be under the charge and direction of a skilled artist a photographic department at the museum to illustrate all this history, and, whenever possible, photographs of operations and conditions in the field of a medical character should also be sent in with the reports of medical officers. In fact, the necessary steps to furnish a complete medical and surgical history of the present war, in all the various branches and departments involved—in so far as this country is concerned—should be substantially put on foot without another day's delay.

All this will require the necessary appropriations to be made promptly by Congress—that is, the means to erect the new museum building, to equip it properly, and to bring into existence, under Colonel Owen's command, the necessary additions to the staff and other forces to care for that history, until it is safely published and landed as a series of sumptuous quarto volumes on the shelves of the new library in the new Army Medical Museum; and this latter erected as designed, on the site selected at the capital of these United States of America.

Even at the present time had such a collection started a year ago there could have been put on exhibition missiles, appliances for engineering and carrying to enemies' lines poison gas, devices for liquid fire, surgical instruments, pathological specimens, and moving pictures of operative technique which would have been of the greatest service to both medical and line officers receiving their preliminary education in this country. An act of Congress will be required first to give Colonel Owen an adequate staff for the collection of specimens; second, for the erection of a museum in which they may be suitably stored and exhibited; third, to enable him and his associates to properly catalogue these specimens and to begin that history of the present war which will rank with those volumes so creditable to the profession of medicine which were published concerning the medical and surgical conduct of the Civil War.

REPORTS ON THERAPEUTIC PROGRESS.

THE MEDICAL ASPECT OF GASTRO-ENTEROSTOMY.

In the *American Journal of the Medical Sciences* for December, 1917, CARTER wisely discusses this important subject. He says that when one looks at the surgical statistics of the end-results of gastroenterostomy it will be seen that in comparison with the medical results the percentage of cures is higher, apparently increasingly so, as the cases are properly selected, operated upon by a competent surgeon, and *judiciously cared for and fed after the operation.* Very few people, however, would choose an operation if they could be cured by medical means, so that it is always well to remember that there are at least 20 per cent of medically permanent cures—probably a much higher percentage.

Joslin reports 82 cases of chronic ulcer treated surgically with these results: Cured, 47 per cent; improved, 19 per cent; unimproved and died, 34 per cent.

Peck reports 74 cases of duodenal ulcer from the Roosevelt Hospital. Of these there were cured, 68 per cent; improved, 7 per cent; unimproved and died, 8 per cent. He was able to trace only 54 of the 74 cases, and of this number actually traced the cures were 84 per cent. Peck's results were a little less favorable in gastric ulcer.

Kuttner reported 1100 cases treated surgically, showing 65 per cent cured.

Presbyterian Hospital records of 31 cases traced by the author showed: Cured, 64 per cent; improved, 19 per cent; unimproved and died, 19 per cent.

Martin and Carroll, of Baltimore, report 45 per cent unfavorable results in gastroenterostomy and advise pylorectomy.

These surgical statistics show, for this combined series of 1285 cases, 64 per cent cured, as compared with 20 to 40 per cent cured medically, and also some of Kuttner's cases had gastroenterostomy for other conditions than ulcer. (1) That the results are progressivsly more favorable as the operation has approached its present technical perfection; and (2) that there are still too many surgical failures. These failures may be traced for the most part to (1) poor operative risks; (2) a poorly selected and performed operation in the hands of inexperienced surgeons; (3) poor postoperative diet and care.

Mention has already been made of surgical failures from poor postoperative care and diet, but this point needs further mention, for it is of paramount importance if we are to get the best results obtainable in these cases of gastroenterostomy.

Up to the present most surgeons have been extremely careless in the matter of postoperative diet, and one sees even now patients, not yet two weeks postoperative, getting regular hospital fare, including, as it does, corned beef and cabbage. It is hard to explain this lack of care on the part of some (but fortunately not all) surgeons, unless it is that the results in some cases, in spite of careless feeding, are so brilliant that the impression is gained that no particular care is necessary. But when one stops to consider the conditions present it seems little short of criminal to treat those cases as other than cases of ulcer still, until they have had a long enough time for thorough healing.

After operation the ulcer is still present and potent for evil, or it is possible to produce a jejunal ulcer on the jejunal wall opposite the new stoma by constant trauma of rough food plus a hyperacid gastric juice.

All cases of gastroenterostomy should be given, postoperative, a regular ulcer diet, giving the old ulcer the most favorable opportunity to heal and preventing food irritation elsewhere, notably at the site of the new opening, surrounded as it is by tender and vascular mucous membrane, or opposite the stoma, as already explained. The postoperative ulcer cure may be hurried rather more than under strictly medical

conditions, but the fact remains that every opportunity for healing and cicatrization should be given, involving, as this does, weeks or months during all of which time the diet should be bland, soft, and free from all thermal, mechanical, or chemical irritants.

When this is systematically done we may hope in properly selected cases to get the percentage of surgical cures more nearly approaching the 100-per-cent mark, and too much stress cannot be laid on the importance of the food and drink factors in the attempt to attain perfect results.

THE VALUE AND LIMITATIONS OF SANATORIUM TREATMENT.

In the *Lancet* of November 17, 1917, LISTER says we may ask ourselves whether the value of sanatorium treatment can be increased by the various special "treatments" that have been introduced. More remotely we might suggest that some of these methods may properly be used to replace the sanatorium altogether, but not yet.

A number of special treatments have been introduced from time to time. There are certain points of unanimity in the desires of those advocating special methods. They like to secure very early cases, and they urge the necessity of hygienic methods being employed as accessories. There seems to be a considerable amount of uniformity in the successes obtained in corresponding classes of cases, provided the hygienic or sanatorium method is not omitted. Lister does not say that this is a suspicious circumstance, but he returns to his confession of ignorance as to the recovery rate of corresponding groups of cases, however treated or untreated. He fears that the public clamor for "cures" may sometimes lead to biased views among those of us who use special methods.

The late Sir James Goodhart said once that when we come in contact with those who advocate "treatments" we are liable to find ourselves in queer company. This opinion was shared, but differently expressed, by Sir Samuel Wilks. We may perhaps regard the hygienic method of raising resistance as a mere accessory. But Lister thinks most of us would say that we have sometimes seen it as the principal factor in the achievement of the results ascribed to special methods, and that these "treatments" are doubtful aids.

Lister thinks we should all like to know where we stand in regard to the use of tuberculin. Is the value of the sanatorium method increased by using any of the derivatives of the tubercle bacillus? If so, what are its uses in the many cases of mixed infection, and the relatively few cases in which a pure infection can be reasonably inferred?

The association of vaccines for mixed infection, with tuberculin, is a difficult, costly, and complicated business. The very few "successful" lung cases Lister has seen treated thus are all dead of their disease. Possibly others have had a more fortunate experience. If this is so then these things should be used more largely than they are at present in sanatoria. Personally, Lister considers that such methods are only adapted for a very small proportion of the total mass that comes before us in institutions, that they are better carried out there under full control than in the consulting-room or home, except under rare conditions, and that therefore the value of sanatorium treatment can be little affected by them.

Arising out of the use of tuberculin is the question of the precise value of that part of sanatorium treatment which is called autoinoculation. Is this theory firmly based? What is the actual process, compared to the use of any of the known varieties of derivatives of the tubercle bacillus?

Closely connected with the increase of resistance that one sees as the result of sanatorium therapy, whether accompanied by the use of vaccine, tuberculin, or autoinoculation, is the nutrition of the body. May not the carefully planned food scale of the sanatorium, with general attention to digestion, rest and exercise adjusted to meal-times, account for many of these al-

leged successes? Lister does not enter into the question of the attention given to nitrogenous food. We know very little about the hematology and metabolism of these patients. Did we know more we ought perhaps to reclassify our cases in the light of such knowledge before we can ascertain the real value of sanatorium treatment. There must be some proportion of patients in whom an improved dietary properly regulated is sufficient to turn the scale in the right direction. There must be some in whom improved nutrition, and, if we like to say so, consequent formation of immunizing bodies, is impossible because of an original fault in their biochemistry. If this is so, deductions must be made from the successes on the one hand and from the failures on the other before we can have a real knowledge of the value of the sanatorium.

A more practical question is occasional difficulty arising from the food in a sanatorium being badly cooked, badly served, and, from ignorance of, or lack of sympathy for, human weaknesses, from an unnecessary monotony in the daily menu. For the convenience of the staff and store-room there is a melancholy recurrence of the same food after the same intervals in the same sanatoria. Loss of interest and loss of appetite result. Patients, staff, and doctors often become institutionalized. There is always a risk of deterioration in official clinicians.

As much as in any other detail the personality and knowledge of the medical officer is all-important in matters of diet. But apart from extreme methods such as zomotherapy, now practically out of date along with overfeeding and excessive milk-drinking, diet is part of the general hygienic method.

Another matter in which the value of sanatorium treatment is difficult to assess is the importance to be ascribed to the use of drugs. So far Lister does not see much difference in the results attained by those who give much or little medicine, whether by the mouth or in other ways. He does not mean the use of medicines for intercurrent conditions, but only such as are claimed to have a special effect on tuberculosis. He would be a bigot who because a patient was in a sanatorium would deny him such help as could be afforded by pharmacy for ailments properly so treated elsewhere.

Lister need not discuss the many drugs that have been used. The legion of derivatives from creosote have almost succumbed to the absence of the German sample post. Creosote itself is still variously used. The so-called nascent iodine treatment seems to be not all that was hoped. Lister has been told by those seeing it in use alongside control cases that there are no reliable contracts. The presence of latent syphilis should be excluded before ascribing any improvement under this method to its effect on tubercle.

The true position is that drugs are accessories to the hygienic method and not the converse. The advocated remedies seem to have their entrances and their exits. Unless Lister is misguided, the hygienic method remains of the same value, whatever that may be, with or without them. It will be useful to learn from those taking part in the discussion how much importance they assign to pharmacy in achieving their results.

There are no doubt many questions which Lister has omitted in trying to point out the difficulty of assessing sanatorium treatment. He trusts these will be recognized.

Meanwhile he will say that the value of the institutions clinically lies: (1) In the persons of their medical officers who can devote a relatively greater degree of special skill in management to their patients than they can usually get at home; (2) in their surrounding and equipment, which offer a relative degree of greater hygienic protection; and (3) in their facilities for affording a better health education.

Their limitations arise from (1) certain deficiencies in medical education; (2) what may be called the lack of a health conscience among the people; and (3) economical considerations.

THE ACTION OF OPIUM AND SOME OF ITS ALKALOIDS ON THE DIGESTIVE TRACT.

MACHT in the *American Journal of the Medical Sciences* for December, 1917, says that in respect to their action on the intestine important differences are to be noted between morphine and opium. In order to understand these it is necessary to examine somewhat in detail the action of morphine on the one hand and of the so-called "minor" opium alkaloids on the other.

When the action of morphine is studied on a segment or a loop of isolated intestine it is found that it powerfully stimulates the peristaltic movements and decreases the tonus of the organ, through an action on Auerbach and Meissner plexuses situated in its walls. A similar effect is produced by the other alkaloids of opium which belong to the pyridinphenanthrene group, namely, codeine and thebain.

The sedative or constipating action of morphine, when it occurs, is due to a number of other effects produced by it, and which counteract the above-described stimulating action. Of these the most important are as follows: (1) A spastic contraction of the pylorus. This hinders the passage of food from the stomach into the gut, and in this way deprives the latter of one of its natural stimuli. Magnus, in a very elaborate study, regards this as one of the chief causes of constipation after morphine. (2) There is a similar tonic contraction of the ileocecal sphincter which tends further to hinder the passage of fecal matter. (3) In the third place there is a diminution in the pancreatic and enteric secretions which also tends to produce constipation. (4) In the fourth place it is interesting to note that although the secretions are inhibited the absorptive power of the intestine is unimpaired. This circumstance, together with the fact that the intestinal contents are propelled more sluggishly, leads to even more complete absorption of fluid and the production of harder feces. (5) In the fifth place, according to Nothnagel, Spitzer, and others, morphine causes an increased tone of the splanchnic nerve centers, and hence a greater inhibition of the intestinal movements. (6) Lastly, it is claimed by some authors that morphine tends to benumb or paralyze the sensory nerve-endings in the intestinal walls and thus render them still less responsive to stimuli.

It is thus seen that while the action of morphine on the Auerbach and Meissner plexuses tends to stimulate the intestinal contractions, some of its other effects on the intestine tend to counteract this stimulation and inhibit the contraction, and still other effects, by producing changes in the consistency of the feces, tend still further to lead to constipation. The final effect is a resultant of all the factors above mentioned and depends on which of them have the upper hand or the predominating influence. This varies in different animals. Thus in cats and dogs, morphine ordinarily produces purgation. In man the result may be constipation, but very often the peripheral stimulating action is sufficient to prevent it. Again, it is well known that morphine fiends suffer alternately from obstinate constipation and diarrhea.

A PROMPT EMERGENCY HYPNOTIC.

In the *New York Medical Journal* of December 1, 1917, DOUGLAS states that hyoscine, hypodermically administered, has many remarkable and valuable qualities as a hypnotic, but, if uncombined, is very uncertain in action, and often produces most undesirable symptoms. At times it causes refreshing sleep, and no other result is noticeable. Again, perhaps in the same patient, it produces loss of muscular coördination and of memory, accompanied by perpetual restlessness, and requires the constant attendance of a nurse to keep the patient recumbent. Unless restrained he will insist on getting out of bed and falling about the room, with the possibility of seriously hurting himself. If the hyoscine is exhibited for hypnotic purposes, these symptoms are the precise opposite of the results desired. Why this drug acts in such

opposite ways in different patients and even at different times in the same patient is a question Douglas leaves for others to explain. If these untoward symptoms could be prevented, hyoscine would be one of our most safe and satisfactory hypnotics. He has combined this remedy with apomorphine, 0.025 to 0.02 grain.

As the author has pointed out in previous papers, apomorphine administered hypodermically in small doses shuts off the stream of consciousness with valve-like precision. Nearly twenty years ago, in a literary contest open to the physicians of the United States and Canada, the judges awarded the prize to Douglas's paper on this subject. For many years he has relied upon this remedy as his most valuable hypnotic. Its action, however, while prompt, is transient. This defect is overcome by hyoscine, the hypnotic effect of which usually lasts several hours. On the other hand, the muttering delirium which so often comes during the first hour after the administration of hyoscine is prevented by the quick hypnotic action of the apomorphine. The synchronous action of these drugs may be expressed diagramatically as follows:

	First Hour	Subsequent Hours
Hyoscine	Delirium	Sleep
Apomorphine	Sleep	

In many cases 0.005 grain hyoscine is quite sufficient, and under no circumstances should 0.01 grain be given. Perhaps the average dose may be given as 1/150 grain.

When Douglas first gave to the profession the results of his experiments with apomorphine he suggested 1/30 grain hypodermically as a proper hypnotic dose. Before that time no materia medica had ever intimated that this remedy possessed hypnotic properties. Since then they have usually recommended for this purpose the same dose that Douglas originally suggested. More extended experience, however, has convinced Douglas that a smaller dose is usually preferable. The careful regulation of the dose is important. If it is too large it causes vomiting, and if it is too small it is inert; 0.025 to 0.02 grain is usually sufficient. The two remedies should be mixed and administered hypodermically in one injection. If morphine is indicated it combines well with the other two drugs.

Here we have an emergency hypnotic, combining two remedies that are entirely unlike, each attacking the problem from a different angle, each supplying the other's deficiencies, and each correcting the other's faults. When quick action is desired, accompanied by entire safety and a reasonable probability of a good night's sleep, Douglas has found this a most dependable remedy. In the treatment of the excited stage of alcoholism and other mental ailments it is especially valuable. It promptly overcomes the insomnia of these patients, regardless of their wishes in the matter. To be able thus safely to force sleep even when the patient's unbalanced mind makes him earnestly desire to keep awake, is an accomplishment that gives satisfaction to every one concerned.

TREATMENT OF PERNICIOUS ANEMIA —ESPECIALLY BY TRANSFUSION AND SPLENECTOMY.

In the *Boston Medical and Surgical Journal* of November 29, 1917, we find a very valuable paper by MINOT and LEE on this subject. They conclude that there is no known treatment that cures pernicious anemia.

From a study of 96 cases and the literature, the treatment of this disease, especially by transfusion and splenectomy, has been considered. Forty of the 96 cases were not transfused or splenectomized.

The first essential for treatment is a correct diagnosis. The diagnosis is not to be made on the blood smear alone, and, unfortunately, is seldom made early.

A careful, detailed study of the activity of the bone-marrow and red-cell destruction is important for prognosis and therapy. Bone-marrow stimulation and bone-marrow threshold have been discussed. Not only one but all of the three chief elements of

the marrow must be studied: the polymorphonuclear neutrophiles, red cells, especially young red cells, and platelets. Observations on the latter are important. Certain elements, often taken to indicate stimulation of the marrow, do not always indicate this, or at least are not always associated with a favorable prognosis. Such elements at times are of bad omen.

It has been pointed out that certain types of pernicious anemia are to be recognized. Those types of cases that do the best spontaneously usually, but not always, receive the most benefit from treatment. Older patients are more apt to have a less relapsing and less hemolytic type of the disease than younger individuals. Cases with enlarged spleens, together with somewhat enlarged livers, when these enlargements are associated with and probably due to hemolytic activity, are apt either to have, or to have had, a more favorable course of the disease than those cases without such enlargements.

It is important that all cases should have proper general treatment.

Transfusion and splenectomy offer the best means for inducing remissions, though a remission can occur spontaneously as marked as those inaugurated by these procedures.

No case is too sick for transfusion. Transfusion can give rapidly symptomatic benefit. It may also, either directly or indirectly, rapidly or slowly, cause stimulation of the marrow or allow increased activity of the marrow, so that a remission is inaugurated.

Isohemolytic reactions will not occur with properly selected donors. Other reactions of unknown nature, usually much less severe, cannot at present be avoided. It is suggested that some reactions following transfusion may be dependent upon the fact that the patient has previously received transfusions of blood. Such reactions are, perhaps, associated with a rapid and excessive accumulation of blood pigment in the body.

Splenectomy for pernicious anemia is a palliative operation. It checks the red-cell destruction and increases the activity of the marrow. Good remissions follow splenectomy more consistently and uniformly than after other forms of treatment. Splenectomy is reserved for only selected cases in certain stages of the disease. It is a serious procedure, is not to be urged, but at times may be advised, provided the patient understands that its effect is only temporary. The cases of pernicious anemia that approach the disease hemolytic jaundice are the most suitable ones for splenectomy.

By means of transfusion and splenectomy we believe that patients do better and can be made more comfortable while they live, and that in certain instances they may perhaps live longer than without such treatment. Probably when transfusions are begun relatively early, so that the patients never remain very anemic for long periods, the best ultimate result will be seen.

Roentgen-ray exposures of the spleen have at present shown no definite beneficial effect.

OBSERVATIONS ON GASTRIC AND DUODENAL ULCERS, DATING OVER A PERIOD OF TWO AND A HALF YEARS, WITH RESULTS FROM A COMBINED MEDICAL AND SURGICAL TREATMENT.

To *Northwest Medicine* for December, 1917, RICHARDS makes a report on eighty-five cases of gastric and duodenal ulcers. Of this series thirty-five were treated medically and fifty surgically. Of the surgically treated ones seven had perforated ulcers, five duodenal, and two gastric. Richards also had a number of cases in which merely a diagnosis was made and which received no treatment from him. These and a rather small percentage of those treated by him were lost track of and are not included in the summary of results.

Before beginning the review of the medical treatment Richards wishes to call attention to the fact that in 6 per cent of the cases operated on it was impossible to find an ulcer, and certainly the error in diagnosis

of the medically treated cases is as large and probably considerably larger, because most of them have had milder symptoms and over a shorter period than the more aggravated cases which are willing to be operated upon. Particularly are the *x*-ray findings more definite in the old chronic cases. Richards is sure that this factor should be considered in the statistics of any series of ulcers not demonstrated at operation or autopsy.

The medical treatment in brief consisted of the control of the free acid and pain by alkalies and in many cases belladonna and a long course of dieting. Many were controlled while in bed at the hospital, and others were allowed to remain at home, returning to the office at frequent intervals for stomach aspirations. The length of time during which these patients were under observation varied from one month to two years, averaging four and one-half months. The average time lost from work was seventy days, and some of the patients employed at hard manual labor were never able to return to the same work without a recurrence of symptoms.

Twenty-five per cent of the medically treated cases later showed some return of their former trouble and still have to remain on a careful diet. Twenty-five per cent are apparently cured at the present time. Fifty per cent were only temporarily if at all improved, and forty per cent of these returned later for operation. The mortality of the medical treatment was *nil*.

Twelve per cent of the operated cases had had previous appendectomies, and in four per cent the gall-bladder had been either removed or drained. In 50 per cent appendectomies were performed by Richards in addition to gastroenterostomies either on account of combined history of symptoms or for definite macroscopic pathology.

The surgical treatment consisted of a posterior gastroenterostomy in all cases except the seven perforated ones. In six of these the ulcer was merely closed and free drainage established. The seventh case was in such a desperate condition, after a fifty-hour perforation, that a hurried laparotomy and drainage alone were done.

A striking feature of these perforated cases is the complete absence of all symptoms following the operation. In fact, the results have been so uniformly good that one almost feels the surest way to cure an ulcer is to let it perforate.

One rather alarming complication following operation was the development of pneumonia in 12 per cent and of pleurisy alone in 4 per cent. In all cases except one the pneumonia was of the mildest type. It may be a coincidence, but since Richards has been paying more attention to the patient's mouth before operation, especially in the stomach cases, this percentage has been decreased. It is, however, a very striking fact that nearly all of his postoperative pneumonias have followed upper abdominal operations.

The average time that all these cases remained upon a prescribed diet and medicine following the operation was three months. The average time lost from work was fifty-three days. One case, a banker, returned to work in nineteen days; another, a hotel manager, in seventeen days.

Five per cent have had some return of symptoms and have had to resume restricted diet for short periods. Two cases report no improvement in symptoms after one year. One developed a vicious circle shortly after a gastroenterostomy and had to have a lateral anastomosis performed, and was not relieved of vomiting until saturated with belladonna. He writes now after an interval of nearly a year that he is as bad as ever. He has not returned for further examination, and Richards is not able to explain the cause of the trouble.

The other patient comes from an exceedingly neurotic family, of which she has inherited her just share. She has had many hysterical fainting spells before and after the operation, but now looks the picture of health, so Richards is not able to judge the severity of her returned symptoms. She has, however, a higher postoperative acidity

than usual after gastroenterostomies which frequently show no free HCl and a low total acidity. A third case, operated on last June, still has abdominal pains and has improved but slightly, owing to a fresh tuberculous peritonitis which was found at the operation, arising from the tubes.

Eighty-five per cent of the cases report very satisfactory results from the combined surgical and medical treatment. Of course, two and a half years is insufficient time to pass judgment as to the final results of such treatment, as some may and probably will have a return of symptoms.

Two of the operated cases died, one in six months after the operation, of typical pernicious anemia. The other died of a double lobar pneumonia four days after operation for a perforation of thirty hours standing. The patient had traveled twenty-five miles in a sleigh in the middle of winter. He was an alcoholic and gave a positive Wassermann test.

Three cases which had had gastroenterostomies performed elsewhere came under Richards's care last year with a return of symptoms. One was done four years ago, another five, and the third ten years ago. In all of these, as demonstrated by an *x*-ray examination, the gastroenterostomy was well open; in fact, so much of the meal went through it, it was impossible to fill the duodenum sufficiently to demonstrate a cap. None showed a six-hour retention. One had free HCl and total acidity 34, another free HCl 18 and total 50, and the third free HCl 10 and total 28. The symptoms in the first quickly disappeared after taking dilute HCl, and Richards is inclined to think her symptoms were more intestinal than gastric. Another got well immediately upon going to the mountains away from some very strenuous business worries. The third had improved upon belladonna, since most of his trouble seemed to come from a marked hypermotility.

A fact Richards wishes to emphasize particularly is that until very recently there has been gross neglect on the part of surgeons doing stomach work in the matter of postoperative treatment. Certainly a gastroenterostomy does not cure an ulcer, either gastric or duodenal. It is merely a means to that end. If a careful regulation of the diet and control of the acids will cure a large percentage of ulcers without operation, certainly these measures will act as valuable adjuncts to the benefits derived from the operation and probably hasten a cure. In some cases the alkalies may not be necessary, as the regurgitation of bile and intestinal juices may be sufficient to control the acids. Richards feels convinced that the failure to follow out some such postoperative treatment which has been commonly neglected in the past explains the return of symptoms in many of the cases treated by gastroenterostomy alone.

TARTAR EMETIC IN TREATMENT OF MALARIA.

To the *Lancet* of November 17, 1917, FALCONER and ANDERSON make a report on this subject, stating that in view of a paper by Sir Leonard Rogers the following eight cases were treated intravenously with tartar emetic. They were treated during February, 1917, and include infections both with benign and malignant tertian parasites. All had a previous history of attacks of malaria. During this period, though relapsing malaria was frequent, it was clinically of a mild type and responded well to treatment with quinine by mouth. The cases chosen for treatment with tartar emetic were selected in so far that only those showing a fair number of parasites were taken. In all some 12 cases were selected for treatment, and the results of eight of these are published in detail.

The tartar emetic was used in 2-per-cent solution, to which ½ per cent carbolic acid was added to preserve its sterility.

Of these eight cases there were two mixed infections, one subtertian malaria, and five benign tertian malaria, three of which showed gametocytes.

Of the two mixed infections, the crescents disappeared in both cases, the benign tertian

parasites persisting in one and disappearing in the other.

In the subtertian crescent infections the crescents disappeared after three injections of tartar emetic. In spite of the disappearance of the crescents the patient had three typical clinical attacks of malaria, though the parasites could not be demonstrated again in the peripheral blood stream.

Of the five benign tertian infections, in none did the parasites disappear from the blood stream till large doses of quinine had been administered.

In the three cases in which gametocytes were seen, in two the gametocytes were not found subsequent to the tartar emetic treatment; in the other case the gametocytes persisted.

Neither in the subtertian cases nor in the benign tertian cases was any marked clinical improvement noted, and certainly in the benign tertian cases the tartar emetic did not appear to exert any effect whatever on the parasites.

These results coincide with those of Low and Newham, reported in the *British Medical Journal* of March 3, 1917, and the results of cases treated in other hospitals, and were so disappointing that the writers did not feel justified in continuing the observation.

COMPARATIVE ACTIVITY OF LOCAL ANESTHETICS—PARALYSIS OF MOTOR-NERVE FIBERS.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1917, SOLLMAN reaches these conclusions:

1. Comparison of the efficiency of local anesthetics must be adapted to the special uses of these agents. A complete review of the more important drugs from this standpoint seems desirable. The present paper deals with the motor-nerve fibers of the frog, and should not be transferred directly to clinical conditions.

2. With direct application to the motor-nerve fibers of the frog, cocaine, novocaine, and tropacocaine hydrochlorides and potassium chloride are about equally efficient. The efficiency of alypin hydrochloride is about three-fourths, quinine-urea hydrochloride one-fifth, and antipyrin one-eighth of the efficiency of cocaine hydrochloride.

3. Basic cocaine, novocaine, tropacocaine, and alypin are four to eight times as effective as the hydrochloride. The addition of bicarbonate of potassium does not have this effect.

4. The addition of adrenalin does not increase the efficiency of cocaine or novocaine on the excised nerve.

5. The effects of mixtures of cocaine with novocaine or quinine-urea hydrochloride do not show any potentiation.

6. The addition of potassium to cocaine, novocaine, tropacocaine, and quinine-urea hydrochloride gives marked potentiation; the efficiency being up to eight times greater than would correspond to simple summation of the effects of the ingredients.

7. The potentiation by potassium holds also for basic cocaine—that is, the potentiation by potassium and by alkali are simply additive.

PROPHYLAXIS IN SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

ROSEN in the *New York Medical Journal* of November 24, 1917, in a useful article on this subject reaches the following conclusion:

1. Since infection of the central nervous system takes place during the early secondary period, the spirochetes remaining dormant for months or years without producing signs or symptoms of a morbid process, it is imperative that a routine lumbar puncture should be carried out early in the secondary stage of all syphilitics if neurological complications are to be prevented. Spinal puncture properly performed is a harmless procedure, and while the headache which follows in so many cases may incapacitate the patient for several days, the discomfort is well worth the information which can only be gleaned from cytobiological examination.

2. Early and repeated examination of the eyes and nervous system should be made in the case of every patient in order to detect any changes in their inception.

3. Careful serological observations should be employed as a guide for the indication or contraindication of intraspinal medication.

4. Systematic and intensive treatment, both intravenous and intraspinal, should be administered to patients with a strongly positive spinal fluid.

5. If tabes, paresis, optic atrophy, and other grave conditions are to be prevented, we must interfere early, and by so doing the new school of syphilology which with its modern serological and therapeutic measures stands for progress and prophylaxis will soon be looked upon as a great blessing to mankind, notwithstanding the adverse criticisms of some of our colleagues.

6. Every clinic for the treatment of syphilis should have facilities for all the special examinations necessary and an infirmary where the proper therapy can be employed. It should be emphatically insisted upon that no clinic be allowed to treat the disease unless it can comply with the qualifications specified. In this way only can the secondary complications from syphilis be eradicated or reduced to a minimum.

ACNE VULGARIS.

In *Northwest Medicine* for February, 1918, BROWN insists that the key-note of success in the local treatment of acne consists in keeping open the mouths of the follicles. Bacteria do not thrive unless the ducts are occluded. Cosmetics irritate and close the follicles. Pus organisms rapidly develop in the retained secretions. Treat every case of pustular acne with preliminary hot applications, followed by incision and drainage. The best way to do this is to have the patient stand over a sink and apply wet boric pads to the face just as a barber applies hot wet towels to the face of his customer. After thoroughly soaking the skin, evacuate the contents of all the pustules, using a cataract knife or cambria needle. Express all plugs; then with a hard-wood toothpick, lightly tipped with cotton, touch the floor of each lesion with a solution of equal parts of iodine, phenol, and camphor or chloral. Next promote bleeding by further hot applications of boric acid solution. After drying the face apply an ointment. The U. S. sulphur is our best remedy for non-pustular, the ammoniated mercury ointment for pustular, acne.

Bear in mind that all sluggish skins should be first stimulated with a 5-per-cent salicylic peeling paste until a slight dermatitis is produced. This is extremely valuable in promoting drainage, as the outer skin is shelled off and with it many of the comedones. The aim is to obtain a moderate reaction with a little scaling. Follow in a few hours with a soothing boric lotion or cold cream.

Generally it is unwise to use too many local remedies in acne. Learn to apply a single method of recognized value and skilfully adapt it to the changing conditions of the disease. If his treatment had to be limited, Brown would require but four local remedies. They are sulphur, boracic acid, mercury, and salicylic acid.

Never apply sulphur and mercury at the same time, because a chemical change occurs whereby the skin is blackened and comedones are increased in number. There is one exception, however, to this rule. The red oxide of mercury is the one and only form of mercury which may be combined with sulphur without forming the black sulphide and blackening the skin (O. L. Levin).

When the skin is very greasy a 1-per-cent solution of iodine in benzine will be found remarkably efficacious. It should precede the application of other remedies. Hand sapolio is a most excellent soap to use once a week in protracted, sluggish cases of acne. Always remember that distinct improvement usually results by alternately stimulating and soothing the diseased portion of the skin.

Nearly all the old text-books recommend

"lotio alba." In Brown's experience he has found this an overestimated remedy. Boric acid lotion followed by sulphur or mercury ointment is more effective and less expensive. Bear in mind that success in the treatment of acne depends upon attacking the malady in several ways at the same time. Remember that a patient with acne is not an invalid. What he needs, as Skillern says, in nine cases out of ten, is correction of faulty habits. Acne is seldom seen in sailors or others who lead an active outdoor life.

Remember that you will always be hampered in local treatment unless the patient agrees to take a daily bath. The skin sweats from one to three pints daily, almost as much as the output of the kidneys and more than the lungs. In obstinate cases of acne always apply ointments with considerable friction morning and night. Ointments may be preserved from becoming rancid by adding ½ per cent of formalin to each jar compounded. Any thin oil base may be stiffened with simple cerate and rose ointment until the right consistency is secured.

Patients are grateful to a doctor who prescribes a local remedy that is agreeable. Druggists all know that the perfume is the very soul of a cream; it is what sells it. Do not try to get along with a cheap perfume, if your patient can afford to pay for a good one. Face creams and ointments demand better perfumes than simple body ointments. It is also well to remember, as suggested by H. C. Bradford, that artificial and synthetic oils "stand up" better than the natural productions. Alkalies destroy the odor of natural oils and soon decompose them. A small amount of natural oil judiciously mixed with synthetic perfumes will, if wisely selected, serve well. Do not skimp in the amount of perfume used, since few persons object to an excess of pleasing perfume in a product. Employ synthetic oils when you can because they are much cheaper than the natural oils; they are also more uniform, stronger, and more permanent. Terpineol (Fritzsche's), for example, is a synthetic oil of powerful and pleasing odor and is inexpensive. It is best combined with concentrated natural oil of rose sufficient to yield a pleasing odor.

In conjunction with the above measures a properly prepared autogenous vaccine or a stock vaccine may be employed and often aids in hastening a cure. In Brown's experience, however, vaccines are not essential. A cure may be effected without them.

THE MEDICAL MANAGEMENT OF PEPTIC ULCER.

In the *Medical Sentinel* for November, 1917, KNOX makes the following statements:

1. An ulcerated duodenum or stomach will heal spontaneously if given but half a chance.

2. Even in the presence of a corrosion by the gastric juice, provided the corrosion period does not exceed in duration that of normal gastric digestion, the tendency of an ulcer is to spontaneously cicatrize.

3. Surgery by establishing an artificial opening between stomach and jejunum enables the former to evacuate itself in normal or less than normal time, thus rendering conditions relatively favorable to the healing process.

4. Gastroenterostomy will suffice to heal the majority of peptic ulcers, but the means does not justify the end.

Knox does not elaborate upon the monotonous details of medical treatment. Instead, he confines himself merely to a broad consideration of the principles involved. Any one desiring to familiarize himself with the technique here advocated is referred to an article by Sippy, published in the *Journal of the A. M. A.*, May 15, 1915.

The sole objecet of medical treatment is to render the gastric juice alkaline and keep it so from early morning until late at night. This is accomplished by means of feeding the individual each hour from 7 A.M. to 9 P.M. and midway between each feeding administering alkali in sufficient doses to neutralize the acidity of the individual case.

Late in the morning, and in the afternoon and evening, the stomach is aspirated and the contents analyzed to determine whether or not acidity is being controlled. In the event free acid is discovered, the amount of alkali is increased correspondingly until absorption control of the case is obtained. If distress or burning is felt during the night, the stomach is emptied of any secretions it may contain and alkali again administered. The diet, while under control, consists mainly of milk and cream, cereals, eggs, and soups. The patient must remain in bed for a period of from three to six weeks, preferably in an institution. Ambulatory treatment is doomed to failure and should never be attempted. Since no two cases will behave in just the same way, constant vigilance over gastric secretions by means of the stomach-tube cannot be relaxed. Should the same be neglected, it subjects the patient to the same hit or miss chance for recovery as the man who has been gastroenterostomized. It may with some justice be argued against this method that the conscientious carrying out of such a scheme involves an immense amount of painstaking effort and cannot be accomplished without the intelligent coöperation of an intern or highly skilled nurse capable of stomach aspirations and analysis. No detail can be omitted, and the many failures encountered in a perusal of case records from various institutions where this plan is utilized represent ninety-nine out of a hundred times failure of adherency to the strict rules of the game.

Aside from the above, the best known and most popular medical treatments are the so-called von Leube and Lenhartz, or one of their various modifications. A hurried consideration of these will suffice to explain, not only why they are sometimes successful, but also why they so frequently fail. Both include absolute rest in bed for a period of about one month, during which time food is administered at frequent intervals in gradually increasing quantities. With the von Leube method Carlsbad water is prescribed each morning, while Lenhartz gives bismuth subnitrate in thirty-grain doses twice or three times a day. The fact that success of medical treatment depends solely upon complete neutralization of the gastric juice is not taken into consideration by either of these men; their methods are empirical, inaccurate, usually inadequate, and in many cases will fall far short of the cardinal object sought. To these blind methods of handling the disease may be ascribed the disrepute into which medical management has fallen.

It is not to be assumed that medical treatment is herein advocated for all cases of ulcer, both acute and chronic, in the presence of the manifold complications which may arise. Perforation, perigastric abscess, cicatricial narrowing of a high degree, or a reasonable suspicion of malignancy, it goes without saying, are all definite surgical indications which no intelligent person would tamper with medically.

USE AND MISUSE OF THE X-RAY.

The *Medical Sentinel* for November, 1917, points out that while great good has come and will continue to come from improved technique, nevertheless the general use of the *x*-ray by those who are not properly trained in pathology and *x*-ray interpretation has resulted in an infinite amount of error and clinical disaster. Even some of our best-known roentgenologists have not escaped, and our roentgenological literature is filled with fantastic ideas and useless advice and procedures, because many of the American roentgenologists have not been sufficiently trained, as have their European collaborators, in the fundamental branches of medicine, chief of which are pathology and clinical hospital experience.

It is a matter of daily experience to find patients rushed to the *x*-ray laboratory before any clinical investigation has been made of the case, and often organs have been photographed which would be not at all likely to show any results. Far-reaching interpretations are being placed upon most trivial and often normal findings. This

holds particularly true of the lungs and the gastrointestinal tract. Bands of active tissue and sharply defined calcified areas in or about the lungs are interpreted as active processes. Normal shadow and shadows due to plate, posture, and developmental defect are interpreted as disease. Peristaltic waves, spasm, and defects shown on single plates or examinations are repeatedly interpreted as ulcer or cancer in the stomach. Minor degrees of atony or elongation of the stomach and colon are interpreted as ptosis, and surgical procedures advised; to say nothing of such procedures advised through misinterpretation of other normal, or slightly pathologic, functional states.

On the other hand, through the same source of error and neglect to appreciate the value of the *x*-ray, many conditions are overlooked. Probably as many errors are being made through lack of appreciation of the finer changes as are being made through the exaggeration of unimportant changes.

OBSERVATIONS ON THE TREATMENT OF MYELOCYTIC LEUKEMIA BY RADIUM.

To the *Boston Medical and Surgical Journal* of November 15, 1917, GIFFIN contributes a very interesting and valuable paper on this subject. From his experience he concludes as follows:

1. Thirty consecutive cases of myelocytic leukemia were treated by means of the surface application of radium element over the enlarged spleen. A dosage of 50 and 100 mg. was used. The protection finally adopted was 2 mm. of lead and ½ inch of wood. The splenic area was mapped out into squares after the manner described by Ordway, and the radium was applied over each square for from two to four hours, with a total exposure usually of twenty-four or thirty-six hours. The exposures were repeated every week until a satisfactory remission was obtained.

2. A certain degree of general improvement, together with reduction of the size of the spleen and of the leucocytic count, occurred in every instance, even in the most advanced and toxic cases. Marked temporary improvement occurred in 26 patients, and a remarkable improvement in 13. It is impossible satisfactorily to discuss the subsequent histories of these cases as yet.

3. Hemorrhages ceased as a rule after one or two series of exposures. In two instances hemorrhage occurred after radium exposures when it had not occurred previous to treatment. In these instances the hemorrhage seemed to be the result of overexposure; an anemia also developed; both the hemorrhage and the anemia were successfully combated by means of transfusion.

4. In 25 patients there was definite improvement of the anemia concomitant with the improvement of the general condition. The reduction of the number of leucocytes was due chiefly to not only an absolute but also a striking relative fall in the myelocytes; there was a striking fall in the absolute count of polynuclears, while their relative percentage remained approximately the same. There was also a marked fall in the absolute count of small lymphocytes.

5. Surface exposures of radium over the spleen of myelocytic leukemia usually effect a very rapid reduction of the size of the spleen, a fall of the leucocytic count, improvement in the general condition, and, together with transfusion, constitute at present the most effective temporary measure in the treatment of the disease.

THE PREVENTION OF MALARIA IN WAR.

GILL in the *Journal of the Royal Army Medical Corps* for October, 1917, states that in his opinion the principles underlying successful quinine prophylaxis are as follows:

1. Owing to the fact that quinine is almost completely eliminated from the system within forty-eight hours, the drug requires to be exhibited at intervals of not less than this period.

2. The amount of quinine requires to be

varied in accordance with the intensity of local malaria, and in places where the disease is highly endemic a daily dose of not less than ten grains of quinine should be given to adults.

3. In the case of malarious subjects it is not reasonable to expect that quinine given in *prophylactic* doses will suffice to prevent the occurrence of relapses as well as the acquirement of fresh infection. In such cases the patient requires to be placed on a *curative* system of treatment.

4. The arrangements for the exhibition of the drug must be of a nature which will insure that the quinine either in liquid or tablet form is consumed with regularity.

5. The prophylactic use of quinine may, if circumstances permit, be combined with antimosquito measures, but the energies of medical officers and others must not thereby be distracted from prosecuting the main line of defense, viz., the inauguration of an efficient system of quinine prophylaxis. [With this view many men of experience will disagree.—ED.]

6. In countries possessing a subtropical climate, in which the active transmission of malaria is confined to a certain season of the year, the above procedure need only be continued during the malarial season.

THE TREATMENT OF ENLARGED CERVICAL LYMPH-NODES IN CHILDREN.

In the *British Journal of Children's Diseases* for July-September, 1917, CUMSTON advises that if the lymph-nodes are adherent to the surrounding structures, or if they are progressing toward suppuration, surgical interference is indicated. If the subject comes under treatment after the glands have broken down and have discharged their contents, leaving fistulæ as a result, Cumston knows of no more efficient treatment than that of the sulphur waters of Schinznach-Les-Bains in Switzerland, and he has observed some really remarkable cures obtained at this spa in these particular cases.

The use of proper drugs must not be overlooked, such as the cacodylate of sodium. Cod-liver oil is of great benefit, likewise the phosphoglycerites. The former may be combined with other drugs as in the following formula:

Ol. jecor. aselli, 500 grm.
Syr. ferri iodid., q.s., according to age.
Glycerini, 100 grm.
Sodii arseniat., 3 grm.

M. S.: Three to four dessertspoonfuls daily, according to the age of the child.

Cumston has also obtained good results from the administration of the *sirop iodotannique* of the French Codex. Its composition is:

Iodine, 2 grm.
Tannin, 4 grm.
Aq. dest., 640 grm.
Sacchar. alb., 360 grm.

Of this from two to four dessertspoonfuls daily, according to age.

The following combination is good:

Ol. jecor. aselli,
Syr. calcii lactophosphat.,
Glycerini, ää 100 Cc.

M. S.: Shake well. Three to four dessertspoonfuls daily.

Cumston does not think that treatment by the various tuberculins has given sufficient evidence of good results to advise their use in these cases.

As to local medication, when the lymph-nodes are very large or have undergone caseation, heliotherapy, or injections of camphorated naphthol or camphorated thymol, are useful. But from the purely surgical standpoint Cumston cannot but believe that a properly conducted removal by operation will give the best results and is the treatment to be advised.

THE USE OF NITROUS OXIDE AND OXYGEN WITH REBREATHING IN MILITARY SURGERY.

In the *Lancet* of November 3, 1917, BOYLE emphasizes his belief that it must not for a moment be thought that this combination of anesthetics is suitable for all cases. It is not, but it forms a most useful addition to the armamentarium of anesthetists.

Boyle gives us the type of operation in which, at any rate in his hands, the method is unsuited.

1. Cases when *absolute* relaxation is required all the time.

2. Some abdominal cases—*e.g.*, gall-bladder operations. These can be done, but unless the surgeon is prepared to make a large incision and to inject the muscles with some analgesic mixture the operative procedure will be very difficult. And this holds good to a less extent for appendix operations, but here it is quite possible to do them if the surgeon is going through the muscles over McBurney's point; and if he prefers to go behind the rectus then, unless there is to be injection of the muscles, Boyle would not advise gas and oxygen from the point of view of the surgeon's comfort.

3. So far Boyle has not done much with intra-oral cases, but the few that he has done have been fairly successful. Gwathmey, however, assures Boyle that he has perfected a technique for tonsils and adenoids, and Boyle hopes soon to try it for himself.

Boyle has used this combination in a very large variety of cases; the list includes, amongst others: amputation of breast, hernia, varicocele, varicose veins, trephining, glands in neck, appendicectomy, hysterectomy, gall-bladder, prostate, and various others, including, of course, the many cases of wounded officers and men and their numerous ailments.

Boyle finds that 200 gallons of nitrous oxide and 60 gallons of oxygen are sufficient to last for 2½ hours under ordinary circumstances. He has, of course, done better and also worse than this; but in his experience these amounts are about the average. The longest case that he has so far administered the combination to lasted 2¾ hours.

The work of the nurses is considerably lessened when this combination is employed, for it is obvious that if on the return to the ward the patient is conscious and not vomiting he does not need the undivided attention of a skilled nurse. And this point is of extreme importance in a large military hospital, since it often happens that eight or ten operations may be all from the same ward during a morning's work. The contrast between eight to ten semiconscious and probably vomiting patients and eight to ten men who are conscious and not sick is one that appeals greatly to an overworked nursing staff.

Boyle has been at some pains to discover the opinion of the sisters and nurses with regard to their patients after this anesthetic, and from inquiries which he has made at the various private hospitals for officers to which he is attached, as well as at St. Bartholomew's and the First London General Hospital, the consensus of opinion is that they much prefer to have their patients given gas and oxygen to anything else.

In conclusion, Boyle says that his reasons for bringing this matter forward are because he is quite convinced that it is an advance on the older methods of anesthesia, and, from the patient's point of view, it is infinitely a better form of anesthetic than ether or chloroform; for after this combination the recovery in the great majority of cases is devoid of those unpleasant and distressing conditions with which most of us are familiar.

This paper, then, may be taken as an attempt to procure a more extended use of gas and oxygen with regulated rebreathing in major surgical procedures, and especially in the treatment of the wounded.

Boyle's own experience of this method with our wounded men has been confined to work at the First London General Hospital and to various hospitals for officers in London, and he unhesitatingly says that in his opinion the combination of anesthetics which he has attempted to describe is infinitely better for most of the men than ether, chloroform, or mixtures thereof. Of conditions at the front he cannot speak with such certainty, as he has, unfortunately, not been there, but it appears to him that it would be of considerable advantage if after most of the operations the patients were

conscious within a few minutes. It would lessen the work of the orderlies and nurses, and, apart from this aspect of the matter, we must remember that this anesthetic is non-toxic, and therefore there is less strain put on to the patient, seeing that he does not have to eliminate the drug, be it ether or chloroform, from his system. Moreover, there is no shock after gas and oxygen.

Finally, Boyle gives one word of warning. This combination of anesthetics is not one to place in the hands of the careless or inexpert—it requires skilful administration, and if used carelessly will inevitably lead to disasters.

PNEUMONIA IN EARLY INFANCY AND IN CHILDHOOD.

In an article contributed to the *Journal of the American Medical Association* of November 17, 1917, KOPLIK says that any one who has seen several decades of the management of pneumonia in infants and in children must come to the conclusion that it is not the remedies that determine a successful issue, but the manner in which they are applied. Formerly, certain remedies, such as chest poultices, cold compresses around the neck, expectorants, cardiac stimulants, cardiac depressants, and aconite, were advocated with empiric ardor. In the treatment of pneumonia, Koplik has been guided, first by the proper nursing and feeding of the patients, and then, from a medical standpoint, he has tried to support the strength of the patient with drugs, endeavoring at the same time to recognize complications and to meet them as quickly as he could.

He has rarely, if ever, resorted to antipyretics for the control of the fever. The fever is a valuable guide in the management of pneumonia, and it cannot be controlled to any great degree—that is, depressed—without injury to the patient. It is simply an expression of reaction of the economy against the inroads of the disease. We should allay the irritability of the nervous system and thus aid the patient to withstand the fever. It is just as well to sponge the patient with lukewarm water and not to resort to ice-cold packs or cold baths. The ordinary application of cool water to the chest in the form of compresses is sometimes as effective as any form of hydrotherapy, provided the patient is protected from exposure when the compress is on the body, or when it is changed. If the patient is irritable, and there is a moderately severe fever curve, a warm mustard bath is effective in quieting the nervous system. After such a bath, an irritable, wakeful infant will fall into a quiet sleep for hours. In short, fever is natural to pneumonia, and we should look with concern on an infant who has a low temperature curve with a severe lung lesion. There is no reaction to the infection in these cases, and it spreads. These patients are weaklings.

With infants, and even older children, we must avoid all disagreeable drug medication. Koplik fears to "upset the stomach," as it is popularly termed, and thereby interfere with his nutritional efforts. This is of especial importance in young infants. Physicians will insist on giving calomel, ammonium carbonate, and ipecac in large, disagreeable doses. Koplik often asks himself, "Why?" They cause vomiting, and in some cases diarrhea, and hamper the patient to an inordinate degree. The superiority of the hypodermic method of medication is well illustrated in the management of pneumonia of infants and young children. The stomach is left free for the assimilation of whatever food the infant may take, and the momentary pain of a hypodermic needle is more than compensated for by the freedom of the patient from dyspeptic symptoms.

Wherever it is possible, Koplik sets great store by the hypodermic method of medication, properly carried out by a careful nurse, avoiding skin infections. The use of camphor (which is not at all new) suspended in oil, with or without caffeine, has proved the most satisfactory from a clinical standpoint. Camphor is a mild cardiac stimulant. After its injection Koplik has found the pulse stronger and more forceful, but only for a short time.

He regards it, like all the resins and balsams, as a mild expectorant, so that its use is justified in two directions. He has never seen any harm result to the kidney from proper dosage. It is difficult to lay down the exact dosage, but camphor suspended in oil may be given subcutaneously at three-hour intervals, a grain for every year of age, up to three or four grains. It may be given to the new-born in doses of from one-fourth to one-half grain. Caffeine is also a useful remedy. It is one of our best cardiac stimulants, but we must remember that it has been shown to be, in large doses, a poison. Therefore caution must be exercised in its use.

It is evident that Koplik regards the treatment of pneumonia at the present day as symptomatic, and that he believes pneumonia to be a disease in which clinical experience must go hand in hand with good judgment, in order that the patient may not be injured while making the fight for recovery. As to serum or vaccines, they have been even less successful in the final results in children than in adults. Their use is still in a developmental stage.

BARIUM SULPHATE FOR X-RAY WORK.

The Prescriber for November, 1917, reminds us that the use of pure barium sulphate for *x*-ray work has already been referred to by it. (See *Prescriber*, 1917, Feb., p. 52.) It is inexpensive, being very much cheaper than bismuth, it is opaque to the rays, and if perfectly pure there is no danger of toxicity. The drawback is its density and consequent tendency to fall to the bottom when suspended in any liquid or semiliquid medium.

A formula for a barium meal is given in the B. P. Codex as follows:

Barium sulphate, 150 gm.
Corn flour, 15 gm.
Sugar, 15 gm.
Cocoa, 20 gm.
Water, 500 Cc.

These ingredients are to be boiled together, and if the mixture is properly made the barium salt is well diffused, and there is little or no risk of it forming a deposit in the stomach or bowel.

R. Bensuade and M. Terrey (*Presse Médicale*, 1917, 25, 168, Mar. 22) recommend a gelatin cream containing 50 per cent of barium sulphate; this can, they say, be kept without any tendency to precipitation for a long time. The preparation of the sulphate requires great care, beginning with pure crystallized barium chloride, which is precipitated completely with excess of sodium sulphate; the precipitate is then washed many times to eliminate every trace of chloride. Incorporated with a gelatin medium it forms a velvety cream in which the barium salt is so finely suspended that it deposits very slowly indeed. An emulsion containing 200 gm. of this cream, 40 gm. of syrup of acacia, and distilled water to 250 Cc., may be made without trouble, and is stable for several hours. A more stable emulsion may be made from 200 gm. of barium-gelatin cream, with tragacanth, 5 gm.; acacia, 2 gm.; glycerin, 40 gm.; and enough water to make one liter. This mixture can be sterilized, and when a deposit forms upon keeping, it is at once diffused by agitation. A barium meal may be prepared by mixing barium-gelatin cream, 200 gm., with powdered soluble chocolate, 50 gm.; powdered agar, 10 gm.; and boiling water, 150 Cc. Very good *x*-ray results are reported from this preparation.

THE TREATMENT OF LEUCORRHEA WITH LACTIC ACID BACILLI.

To the *Journal of the American Medical Association* of December 15, 1917, BLOCK and LLEWELLYN contribute their results with this plan of treatment.

The patient is placed in the usual dorsal gynecologic position, and a thorough pelvic examination made, including smears, when indicated. A bivalve speculum is then inserted into the vagina, and the cervix and the upper vaginal canal exposed. The re-

action of the vagina is then taken by moistening a piece of litmus paper in the vaginal secretion, after which the vagina is thoroughly cleansed of mucus and leucorrheal discharges by means of a simple alkaline spray, and the vagina is then dried with cotton pledgets. A lactic acid tablet, preferably one that is readily soluble and made with a lactose base, is placed in a medicine glass and moistened with *one or two drops* of sterile water dropped on the tablet by means of a small pipette or eye-dropper. It is important not to supply more than a few drops of water to the tablet; otherwise the tablet will completely disintegrate and cannot be readily handled.

If the proper kind of tablet is used, and only enough water is applied to moisten it, it will attain the consistency of thick cottage cheese, and may be readily lifted *in toto* by a pair of forceps. It is then placed in the upper vaginal canal, and spread over the walls and on the vervix by means of the forceps. If the tablet is of the proper consistency, it will adhere to the vaginal mucosa wherever placed, and will show no tendency to run out of the vagina, as is the case with ordinary solutions. The speculum is next withdrawn half-way, with its blades open, to allow the upper vaginal canal to close over the tablet that has been applied. Finally the blades are closed and the instrument is withdrawn. No tampons are applied. The patient is instructed to return in a week, and all douching is absolutely interdicted. On her return the same technique is repeated, and she returns once a week for a reimplantation of the bacilli, until the vagina is acid—a result which in a favorable case is attained in about three or four weeks. After the reaction has become acid no treatment is given so long as it remains so, although the patient returns at gradually increasing intervals to have the reaction taken. In favorable cases it is usually found necessary to reimplant organisms at intervals of from three to four weeks, since after that time the organisms seem to die, or at any rate to lose their potency. Block and Llewellyn therefore state that the treatment is seldom a permanent cure, but rather a good palliative measure, requiring attention about once a month and superseding douches.

GOITRE: USE AND MISUSE OF TREATMENT.

In the *Journal of the Iowa State Medical Society* of November 15, 1917, GRIMES says that the treatment first thought of, and which the patient is usually given offhand, is iodine internally and externally. Iodine externally is in every case absolutely worthless, yet in spite of the inconvenience and discomfort of the local application of iodine, this measure is still practiced.

Iodine internally, in the form of iodides or iodine, is a favorite treatment. This does good only in a very small per cent of cases. It does positive harm where the goitre is parenchymatous or cystic. Many cases of simple cystic goitre have been irritated by iodides and passed into the toxic exophthalmic type. In fact the thyroid condition should be determined before iodine medication for any disease is instituted.

The *x*-ray is another form of treatment that has become popular with many physicians. As is well known, the *x*-ray causes a disintegration and disappearance of parenchymatous tissue. *X*-ray treatment of the thyroid region is fraught with danger. If the treatment is sufficient to cause a disintegration of the hyperplastic tissue, it is sufficient to cause a destruction of the essential parenchyma, and hypothyroidism results.

Grimes has seen two cases of marked hypothyroidism following the *x*-ray treatment for simple goitre. It is not sufficient to know in this treatment that the tumor is diminished in size, but we must know whether in five or ten years after such treatment the thyroid function will or will not be permanently impaired.

The essential treatment of this condition is hygienic and expectant, and if after sufficient constitutional improvement and lapse of time the goitre has not subsided, it should be treated surgically. A goitre that does

not yield to general measures should be removed for the same reason that we remove a wart or cervical ulceration—to forestall malignant development.

The prognosis in this class of cases is good. Eight per cent of observed goitres disappear within two to four years without constitutional symptoms. Upon this fact rests the apparent success of goitre specialists, osteopaths, iodine therapy, and other foolish fads. It may be laid down as a fundamental therapeutic fact that when improvement takes place under opposite forms of treatment, the improvement is not due to the treatment.

The next class—that of hyperplastic goitre of exophthalmic type—has received much attention in the past few years, and we are still familiar with the clinical course, the classical symptoms, and the controversy concerning the treatment. We must remember that the exophthalmic type is associated with a nervous instability, that the rest treatment and regulated life is often quite sufficient. We know that a meat-free diet is of benefit; that surgical treatment in selected cases is successful. Just when to operate and when not to operate is an individual problem. Improvement under medical treatment may not take place because of the nature of the case or may fail because the patient's life cannot be regulated. In either event operation must be recommended. Treatment in a way is like that of tuberculosis; more hopeful where the patient's life can be adjusted to the disease.

The prognosis in most cases is good, but we must remember that of all those surgically treated, only two-thirds are successful.

The next class—hyperthyroidism without hyperplasia or where the hyperplastic changes are not evident—of patients deserves a closer study, and this condition should be kept more constantly in mind in making our diagnosis. The clinical picture of the mild case is so like that of incipient tuberculosis that a great many of them are so treated. The patient complains of exhaustion, nervous irritability, flashes of heat, headache, various pains, and chronic invalidism in general. There is an elevation of temperature closely resembling that of tuberculosis; there is loss of weight, asthenia, etc. A diagnosis can be made only after having the patient under close observation for a number of days, when it will be found that the temperature curve is different than in tuberculosis. The patient does not tolerate a meat diet and stimulating medication as the tuberculosis patient does. The improvement under rest is much more marked in the first few days than in tuberculosis.

The treatment is rest, a meat-free diet, and general hygienic measures. Prognosis depends upon conditions of life and the persistence of treatment; frequent child-bearing works against recovery.

THE DIGESTIBILITY OF BREAD MADE FROM TWO PARTS OF WHEAT AND ONE PART OF OATS, BARLEY, MAIZE, OR RICE.

Spriggs and Weir in the *Lancet* of November 10, 1917, make a report on this subject and conclude:

1. If properly prepared and baked, palatable breads can be made from a mixture of one-third of oatmeal, barley flour, maize flour, or rice flour, and two-thirds of wheat flour.

2. Experiment showed that each of these breads, when taken with a mixed diet, was, for the time of the observation and for this subject, as nourishing as the bread made from white wheaten flour.

AURICULAR FIBRILLATION.

Price in the *Practitioner* for November, 1917, says that the correct treatment is of the utmost importance. Whether there is mitral disease, aortic disease, or disease of the myocardium, if the ventricular rate is rapid, digitalis or one of its allies should be administered, the results in the majority of cases being very good, and in some cases being extraordinarily good; there is a rapid fall in the pulse-rate, and a concomitant improvement in the general symptoms. Two

exceptions are: (1) some cases of well-marked myocardial degeneration, and (2) cases in which there is accompanying pyrexia. In the latter, apparently the response to digitalis, if present at all, is as a rule very slight.

With regard to dosage, Price's custom is to begin with a drachm of the tincture per diem, or in urgent cases even 1½ or 2 drachms per diem, and to continue until there is nausea or vomiting, diarrhea, headache, and unduly slow pulse, or what is called "coupling of the beats." The drug should then be stopped until these symptoms have passed away, which is generally in a few days. In the great majority of cases the patient relapses, and the indication then is to find out what dose suits him best—that is, sufficient to control the action of the heart, without at the same time giving rise to any toxic symptoms; this may require weeks or even months of careful observation. Price generally begins with half the original dose, and this can be increased or diminished according as the rate of the heart increases or diminishes. In this connection help may frequently be obtained from the patient himself, who is often able to say what dose suits him best; in other words, the patient's own sensations are often a good guide, and should be taken into account, as well as the pulse-rate. The dosage necessary in individual cases may exhibit a wide variation; it may be as small as a drachm of the tincture a week, or as large as 45 minims or even more per diem. Having discovered this dose, it will be necessary, in the great majority of cases, for the patient to continue the drug for the remainder of his life. In the course of time variation in the dose may be found to become necessary. The cumulative action of digitalis is apparently not nearly so important as has been believed; at the same time the pulse ought to be watched. "Coupling of the beats" is a danger-signal, and we should either stop the drug for a few days or diminish the dose.

Intravenous injections of strophanthin may be used in urgent cases of cardiac failure, when it may be advisable to obtain a more speedy result than is possible by the administration of one of the digitalis series of the drugs by mouth. Price himself employs one dose of 1/100 of a grain, or two or three doses of 1/200 of a grain, every two hours. This may be followed by the administration of tincture of digitalis by the mouth, when advisable.

When auricular fibrillation is not accompanied by a rapid pulse, no decided result usually follows the administration of digitalis; indeed, it is often difficult to be certain how far the improvement may be due to the rest in bed and other measures adopted, apart from the effect of the drug.

THE USE OF CERTAIN BALSAMS IN THE TREATMENT OF SCABIES: A WARNING.

ALLAN writing in *The Prescriber* for November, 1917, expresses the belief that the treatment of scabies is not generally a matter of much difficulty, and few cases of this disease fail to respond to the scientific use of sulphur ointment. Various medications have been recommended in place of sulphur, and among such may be mentioned B-naphthol, creolin, white precipitate ointment, and certain of the balsams. In the *Archives of Pedriatics* a short time ago Montgomery remarked that an excellent remedy, especially in infantile scabies, was balsam of Peru.

Some ten or twelve years ago there appeared in German medical literature records of cases treated with balsam of Peru in which serious symptoms indicative of acute nephritis supervened. Gassman (*Münch. Med. Wochenschr.*, July 26, 1904) reported the case of a man, aged twenty-six years, affected with scabies, who had half the body treated with balsam of Peru vaselin for two nights. He developed acute nephritis. Three per cent of albumin was found, and there were tube casts and blood in the urine. In another case referred to by Richarty (*Münch. Med. Wochenschr.*, May 8, 1916), a patient, aged sixteen years, was treated

with ten per cent balsam of Peru, there being three applications altogether. Acute nephritis was produced, and death occurred in fourteen days.

After reading these reports Allan decided to watch carefully the effect of storax in some cases of scabies in children, and in a short article in the *Hospital* he recorded his observations at that time. The ointment used was as follows:

Styracis, ounce j;
Ol. olivæ, ounce ss;
Ceræ flavæ, drachm ij.

It was prescribed to be rubbed into the affected parts twice daily. Briefly, the results of Allan's observations were that, within two or three days of the exhibition of this ointment, albumin appeared in the urine; that such albuminuria was transient, the albumin disappearing within a day or so of the application of the storax being stopped; and that the further administration of the unguent in question was followed by albuminuria. At that time five cases all reacted in this way, and he has since had many opportunities of observing the same phenomena, both with storax and with balsam of Peru, so that it can hardly be argued that albuminuria is a mere coincidence. It should be pointed out that in testing for albumin the cold nitric acid test is not relied on, for it is well known that nitric acid, or indeed any acid, precipitates the oleoresins.

Allan's purpose in calling attention to this matter is not to veto the use of storax or balsam of Peru in the treatment of scabies, but merely to indicate a possible danger accruing to their promiscuous employment. It must not be inferred that albuminuria supervenes after their use in every case, but in Allan's experience it is produced in a large percentage of cases, and at the moment he can recall only two in which it did not occur. Great care should therefore be exercised in the exhibition of these balsams. The production of albuminuria by them is no doubt alarming, but it is transient if they are discontinued as soon as the albumin appears. As to what would happen if they were pushed after the albuminuria was noted, he is not prepared to say, but it is possible, and even probable, that acute nephritis would develop.

He has already stated that sulphur ointment will cure most cases of scabies, but in a few cases which have become chronic it is not as a rule effective, and in these obstinate cases storax or balsam of Peru, carefully applied, seems to afford a means of curing the disease. He has frequently found that the application of one or the other of these balsams up to the time when the transient albuminuria is produced, followed by the use of sulphur or white precipitate ointment for a few days, will bring about a cure. In very stubborn cases it may even be necessary to employ storax or balsam of Peru a second time, when the urine is again free from albumin. In all cases treated by such means the urine should be frequently examined for albumin, and as soon as any albumin is detected the application of storax or balsam of Peru should at once be suspended. It is only by careful attention to these points that the suggested treatment can be placed on a scientific basis. It is inadvisable to employ this method if for any reason the urine cannot be kept daily under observation, and the treatment is not one that can be recommended in the case of infantile scabies.

ESSENTIAL FACTOR IN THE TREATMENT OF PREGNANT CHOLERA PATIENTS.

In the *Philippine Journal of Science* for July, 1917, LOWELL reaches these conclusions from a study of sixty-six cases:

1. Pregnant cholera cases have a higher mortality than non-pregnant cases, if left to their own resources.

2. The later the pregnancy the graver is the prognosis for the mother.

3. There is some factor other than mechanical which kills the fetus very early in the disease in the majority of the cases.

4. Abortions occur in most of the cases, and the older the fetus the greater is the tendency to abort.

5. Most of the pregnancies come to a fatal termination.

6. Abortion is nature's therapeutic measure in aiding the mother in her fight for life.

7. The essential factor in the treatment of pregnant cholera cases is to remove the dead fetus as soon as possible and in the manner best suited to the mother's condition, because it shortens the period of convalescence, preserves the strength of the mother, and reduces the mortality to about that of the non-pregnant cases.

POSOLOGY AND MODE OF ADMINISTRATION OF ADRENAL EXTRACT.

The *Medical Record* of December 15, 1917, claims that the therapeutic indications for suprarenal medication are numerous and varied. Like thyroid substance, the extracts have substitutive and dynamogenic properties. One may do great things with adrenal extract if he knows how to handle it and is familiar with its indications and contraindications. Practitioners at present seem to know only the theories of adrenal activity. At least this is the opinion of Sergent in the *Journal de Médecine et de Chirurgie Pratiques* of October 10, 1917, who adds that they follow a false set of rules in the exhibition of suprarenal preparations. There is too great a fear of large doses, and this is responsible for many failures, for the small dose has a transitory effect. To obtain the desired action it is necessary to give good-sized doses, but they must be given in fractions. The result will be that the patient comes under the influence of the drug, and a sort of equilibrium is maintained. We should reckon always in daily doses in order to get an optimum therapeutic effect.

The case is cited of an attempted suicide in which a drug clerk swallowed 20 Cc. of a 1-to-1000 solution of adrenalin hydrochloride. A quarter-hour later, nothing having transpired, he took 15 Cc. more. Not until after two hours did he develop severe headache, stiff neck, and nosebleed. He decided to live, and at the hospital was bled 75 Cc. by reason of the high pressure (no attempt was made to register it). After the venesection he received emetics and inhalations of nitrite of amyl. Still able to walk, he went to bed and waked in his usual health, save that he showed bloody expectoration. The would-be suicide was tuberculous. Another case showed analogous behavior, and it does not seem likely that any amount of the drug would prove a violent poison, for the very good reason that the greater the dose the greater the degree of vasoconstriction from the local action of the drug on the mucosa. As this condition wears off absorption slowly sets in. The rhinologist knows this fact, and is not afraid of unlimited local application of the drug.

Like numerous other clinicians, Sergent administers the drug per os. Thus given the doses seem to vary very much according to the practitioner, but are always relatively small. No account is taken of the fact that adrenal extract is rapidly attacked by the digestive juices. Sergent, however, after a good deal of experience, decided that a special hypodermic method could be devised to replace exhibition by the mouth. The instability of the drug in the stomach, along with its power of preventing its own absorption, seemed to subvert entirely any prospect of a successful use of the mouth. In the hypodermic use there is also vasoconstriction, but it only slightly delays absorption.

What has been said thus far does not apply to the steady use of suprarenal substance in suprarenal insufficiency, which is a different therapeutic proposition. But these patients often suffer from persistent vomiting or gastric intolerance, and then only the hypodermic route will serve. This is necessarily the case in "acute suprarenal insufficiency," as it is seen in the course of acute infectious diseases. It is precisely in acute insufficiency that a large hypodermic dose is indicated. Here the author gives six, and at times as high as eight, milligrammes of pure drug in twenty-four hours. In ordinary internal exhibition,

suprarenal extract is usually associated with some other endocrinic principle in capsules, and the author has combined buccal with hypodermic medication in certain cases. When we consider that adrenal extract may be a synergist in the treatment of many maladies it becomes apparent that it demands intensive study.

THE PHARMACOLOGY OF THE OIL OF CHENOPODIUM.

In the *Journal of the American Medical Association* of December 15, 1917, SALANT states that little is known of the fate of chenopodium oil in the body, but it might be inferred by analogy that, like other essential oils, it is conjugated with glycuronic acids. It is apparently not eliminated uncombined in the urine or in the bile, for its odor in these fluids is never detected. On the other hand, its elimination by the lungs was observed in experiments on animals after its intravenous administration, for the characteristic odor in the expired air was unmistakable. It is evident from the experimental data that the drug is very active. That this also holds for human subjects is shown by the incidence of poisoning with this drug. Levy reported twelve cases, nine of which were fatal. Coutant reported recently one case of severe poisoning, but the patient recovered. Salant has been informed of several cases that have come under the observation of the medical officers of the International Health Commission. The oil should therefore be handled with caution when used for internal medication, as it has a tendency to affect the central nervous system, the heart, respiration, digestive organs, and the kidneys. In the presence of renal or cardiac disorders the oil of chenopodium should be given in small doses only, while in advanced cases of chronic nephritis or heart disease its use would seem to be altogether contraindicated.

As the liver undoubtedly plays an important part in detoxifying the oil of chenopodium while abnormal changes in the gastric and intestinal mucosa may accelerate its absorption into the circulation, it may be expected that in hepatic and gastrointestinal diseases it may likewise prove more toxic. The importance of the nutritional condition in determining the toxicity of oil of chenopodium has been established by experiments on animals. This applies also to human beings. The case reported by Coutant furnishes evidence of the effects of the drug when administered to the poorly nourished and weak individual. Two doses of 10 minims each given in twenty-four hours were toxic, but the patient was twenty-one years of age and weighed only 95 pounds.

Since cases of poisoning are sure to occur, the question of treatment deserves consideration. When large doses have been swallowed lavage may be resorted to with beneficial results. If carried out promptly after the oil is taken it may prove effective in preventing serious consequences, since absorption of the oil from the stomach is slow. In experiments that Livingston and Salant carried out they often found that several hours may elapse before evidence of absorption into the circulation could be obtained, when the oil was introduced into the stomach of animals, the pylorus having been ligated previously.

The importance of not delaying lavage too long after the poison has been swallowed is further emphasized by the fact that absorption from the duodenum was found, on the contrary, to be very rapid. In some of the experiments in this laboratory the introduction of oil of chenopodium was followed by the immediate appearance of the characteristic effect on the circulation.

No chemical antidote has yet been found. The treatment in cases of poisoning would, therefore, be symptomatic. Stimulation of the respiratory and the circulatory systems would undoubtedly be of value. In experiments on the isolated heart, they found that digitalis and adrenalin are excellent antagonists. The stimulating action of digitalis has been found to be very persistent, and may completely overcome the depression caused by the oil. Caffeine was also tried

out. It, on the contrary, aided the action of the oil of chenopodium. Heart action ceased altogether when perfusion with caffeine followed treatment with chenopodium. The action of caffeine in poisoning with chenopodium may be different, however, in intact animals, and is being investigated in the laboratory.

While oil of chenopodium may be regarded as a safe remedy for patients in good physical condition, it should be used very cautiously in poorly nourished and weak or neurotic individuals. A diet containing a liberal amount of fats and carbohydrates, fed at least for several days before the treatment is instituted, may render the drug much safer. The routine administration of large doses of castor oil before and soon after oil of chenopodium, as recommended by Hall and Foster, should be given serious consideration, as it may prove to be of prophylactic value.

TONSILLOSCOPY AND CURETTAGE OF THE TONSILS IN ADULTS.

In the course of an exhaustive article on this subject in the *New York Medical Journal* of December 15, 1917, FRENCH asserts that by conservative surgical treatment and by the enucleation of the tonsils we shall soon arrive at a better understanding of what systematic disorders are produced by infection from them, and doubtless many surprises are awaiting us. His own experience with curettage has proved that necrotic tissue in the tonsils is the active and apparently the sole cause of various existing disorders. Some of the disorders were, of course, among those now generally attributed to infection, while others, so far as we know, have not yet been suspected of having such an origin. The conditions and diseases which we have thus far demonstrated without doubt to be caused by foci in the tonsils, and which were either partly or completely relieved by curettage, are persistently high blood-pressure; labyrinthine deafness; neuralgia; neuritis; flatfoot; myositis; arthritis; restricted movement of joints without evidence of local disease; bacteriemia; acne; furunculosis; thyroid and various other glandular enlargements—a very marked improvement in one case of beginning exophthalmic goitre; various nasal vasomotor disturbances; June cold; a sessile growth of inflammatory tissue upon a vocal band; gastric and intestinal indigestion; a chronic cough without assignable cause. The explanation of the phenomenon of cough caused by diseased tonsils would seem to lie in the fact that in some cases there are definite reflex areas in the tonsils which when pressed upon with a probe or curette will instantly give rise to an expiratory explosion. Relationships between many other diseases of the body and diseased tonsils are being investigated, but more time and the study of a larger number of cases will be needed before definite statements can be made regarding them.

As by the employment of the tonsilloscope and the test by curettage we can determine quite accurately when permanent relief of the systemic disorders due to infection from the tonsils only can be obtained by tonsil enucleation, the question of the propriety of performing the radical operation upon adults under local or general anesthesia is brought still more prominently forward. It is not French's purpose to invite discussion upon that question in connection with this paper, but rather to offer the suggestion that now that it seems likely that enucleation in adults will for demonstrable reasons more often be deemed necessary, the further study and development of methods of local anesthesia for tonsillectomy be given the most thoughtful consideration.

This quite naturally leads to the final thought to be expressed in his communication, namely, that if it shall be proved that the tonsilloscope is to increase the amount of intelligent operating upon the tonsils, what shall we do to try to insure better surgical work in the future by which those glands will be enucleated with the smallest

chance of subsequent faucial deformity? This question embodies in it a very serious problem for us to attempt to solve.

However lightly the value of the quality and character of the human voice may be discussed by the unthinking and indifferent it, nevertheless, has a very important bearing upon the make-up of a pleasing personality. Our patients have the right to demand of us the best assistance in this matter and to save for them as large a measure of attractiveness as lies within our power. One of America's most popular actors said to the writer not long since: "If in your special field you have the power to conserve the agreeable elements in the quality of the human voice, in singing or in speaking, it is your highest duty to exercise it, for surely the characteristics of the average voice heard in this land are none too satisfying." We, ourselves, cannot view with complacency the probable flattening and unpleasing quality of the voice in the future of the race as the result of injury to the faucial structures from inexpertly performed tonsillectomies. To us it would seem that the need of better teaching and more practice to effect a higher degree of skill in operating was never so imperative. It is, perhaps, much too easy to get the tonsils altogether out of their beds, but the vast array of faucial deformities which stand to-day as witnesses of defective technique makes the need of getting them out, not alone for the effects of to-morrow, but of a year hence, the crying need of the hour.

As it has now been clearly proved that the tonsil is so much more frequently the seat of disease, giving rise to infections, than we had supposed, it would appear that the need of the time is that we should all go to school to learn how to enucleate it with the highest possible degree of skill. The test of an operator's skill should in this particular be the result of his work at the end of a year rather than what seems to be done in the operation itself. If the results at the end of a year are satisfactory, they and they alone can proclaim the skill with which the operation must have been performed. Our need to-day is not better methods of operating so much as the better use of the methods which we have.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF DYSENTERY.

GRAHAM makes a report on this subject in the *Lancet* of January 12, 1918, basing his observations on cases occurring in the British Salonica Force. He believes that the curative action of antidysenteric serum is due primarily to its antitoxic and secondarily to its antibacterial properties. Since the symptoms in bacillary dysentery are due to the absorption of the toxin of the dysentery bacillus, specific therapeutic measures should be directed to the neutralization of the toxin in the most rapid and effective way possible—*i.e.*, by the intravenous injection of dysentery antitoxin. Owing to the low antitoxic content of antidysenteric serum, the amount of serum injected should be greater than in diseases like diphtheria and tetanus. Where it is impossible to give intravenous injections, serum should be given intramuscularly, as absorption is much more rapid than from subcutaneous injections.

Severe reactions, occasionally with a fatal issue, have followed injections of serum. They are more common in asthmatics and in people who have previously been treated by serum, and are more severe following intravenous injections. Asthmatics should receive an injection of atropine before the administration of the serum. The dangers of severe reaction following intravenous injections of serum may be avoided by the Besredka method of administration—*i.e.*, ½ Cc. of serum intravenously, followed in two minutes by 2 Cc., and in five minutes by 5 Cc., giving the balance of the serum in ten minutes. Although this method is uniformly satisfactory, it demands time. Graham's own experience in over 500 cases has been that severe primary reactions may

be avoided by the preliminary administration of 2 Cc. of the serum, and the slow administration of the balance in ten minutes. Mild reactions occurred in a few cases receiving serum by this method. Graham has had one severe primary reaction following the injection of the whole dose of serum at once, and one other case had a severe late reaction occurring the fifth day after the last injection of the serum. This was associated with a marked fall of blood-pressure, the patient reacting after the use of stimulants. Urticaria, joint pains, and pyrexia followed as late reaction in the majority of the cases treated.

It is impossible to discuss the question of serum treatment in detail, and the following remarks are simply some of the conclusions drawn from Graham's experience. In the first place it must be remembered that practically all cases were treated after the third day of blood and mucus. Many of the cases had received 20 Cc. of serum subcutaneously before entering the hospital. There was no evidence that this had been of value. Cases in hospital received from 20 to 80 Cc. of serum once or twice daily, continued in some for as long as nine days. The best results have been obtained from the intravenous injection of from 60 to 80 Cc. of serum, followed by from 150 to 300 Cc. of normal saline twice daily for the first two days and once daily for the next two. In very toxic cases 5 per cent glucose in distilled water should be substituted for the saline. Shiga infections reacted better than Flexner-Y infections, especially when the serum was given during the first three days of the disease. The most striking effect produced by the serum was the relief of abdominal pain and tenesmus; a marked reduction in the number of stools was noted in the majority of cases, but there were exceptions. It is impossible to make a definite statement of the effect of serum treatment in convalescence. This can be obtained only by a careful study of the complete records of cases treated with and without serum. Graham's own opinion is that it had a favorable effect. His mortality was much higher in cases in which serum was given alone, and dehydration of the tissues not prevented by the giving of normal saline intravenously and subcutaneously.

In the treatment of chronic, mild, and mild recurrent dysentery, dehydration, toxemia, and collapse are not disturbing factors, and the use of normal saline is not indicated and serum does not appear to do any particular good. The use of a vaccine is the more rational form of specific therapy, and preparations are now being made for testing it in treatment. In mild cases blood and mucus rapidly disappear, so that treatment must be directed, as in severe bacillary dysentery after the reappearance of a fecal stool, to the healing of the ulcerated mucosa by the judicious use of saline purgatives and careful dietetic treatment.

All patients received on admission ½ ounce of castor oil, followed after eight hours in the blood and mucous stages by 2 drachms of sodium or magnesium sulphate. This was repeated every four hours during the day as long as the mucous stage lasted. After the disappearance of mucus a sufficient quantity was given to produce a soft motion with the idea of injuring as little as possible the healing ulcers in the intestines by the passage of feces. There was no indication for the use of opium in any form as the pain and tenesmus were relieved by the serum. Intestinal lavage with solution of eusol, potassium permanganate, protargol, or normal saline was given morning and evening if the patient received relief therefrom. The use of enemata containing opium is not a rational method of therapy in bacillary dysentery and should be discouraged. Intestinal astringents or intestinal antiseptics by the mouth were not used, as they do not tend to improve the digestion or assimilation of the food in the stomach and small intestine. These drugs, if given at all, should be given as enemata.

Dietetic treatment is the most important

factor in the cure of a patient suffering from bacillary dysentery. Graham's serological examinations have shown that second attacks of bacillary dysentery are very seldom new infections, but relapses from previous ones which have not been cured either from the absence or lack of efficient treatment. Sensitive as the intestinal mucosa in bacillary dysentery is to sudden changes of diet, it is not surprising when relapses occur in patients shortly after leaving hospital, the ordinary diet of beef, vegetables, and bread changing to one of bully beef and biscuits plus exercise. Changes in diet must be gradual and the test of cure in a patient before returning to duty should be—"Can he, while undergoing moderate exercise, withstand the ration he will receive on leaving hospital without having intestinal discomfort?"

In the treatment of the acute phase of the disease, dehydration of the tissues must be prevented, the food must contain sufficient calories for the increased metabolism, and be easily digested and assimilated. The amount of fluid taken by mouth is not sufficient to keep the body fluids normal or above normal, so that the administration of 300 Cc. of normal saline intravenously and a half liter subcutaneously is necessary for the first few days in severe bacillary dysentery. In very toxic cases the substitution of 5 per cent glucose in distilled water for normal saline has the greater value. This not only provides the required amount of fluid, but also stimulates the heart and supplies an extra number of calories in the food. During the first three days milk should not be given in any form. Suitable diet in the beginning consists of albumen-water, gruels, and clear tea sweetened with lactose. Lactose is of great value not only for its supply of food calories, but also for its favorable action on the bacterial flora of the intestine. This diet should be gradually changed to one of arrowroot, Benger's food, malted milk, sour milk, or diluted ordinary milk, lactose diluted in some fluid being continued. It is very important to keep the mouth clean by washes and the chewing of some solid substance while the patient is on liquid diet. When mucus has disappeared soft poached eggs and a couple of biscuits may be given, the inclusion in the dietary of custards, pudding, and dry toast being made gradually. Later a solid diet of chicken, stews, mashed potatoes, peas and beans may be tried, followed by beef, vegetables, and bread. Untoasted bread is a very disturbing factor and should not be given until the patient is accustomed to a solid diet. Where patients remain long enough in hospital dietetic treatment should be completed by giving them the army ration of bully beef and biscuits, besides putting them on moderate exercise.

A competent nurse is a great asset to a dysentery ward. Careful nursing is most essential for the early treatment of dysentery cases. Without her coöperation the administration of fixed dietetic measures is impossible in a ward, where Tommy on solid diet will innocently share his last crust of bread with his less fortunate neighbor on liquids, these dietetic indiscretions being usually the undiscovered cause of the medical officer's disappointment in the progress of his cases.

Graham believes that:

1. Ninety-five per cent of the dysentery occurring in the British Salonica Force is of the bacillary type.

2. Stools in the blood and mucous stage of bacillary dysentery are sufficiently characteristic to diagnose the case "clinical bacillary dysentery," and treat it as such.

3. In fecal stools the presence of cellular mucus in which pus cells predominate or of small groups of pus cells is sufficient to warrant the diagnosis of "clinical bacillary dysentery."

4. A mild form of bacillary dysentery which in this paper has been called "mild recurrent bacillary dysentery" is the cause of the diarrhea in a very fair percentage of the cases admitted to hospital as simple diarrhea.

5. There is no evidence that the intestinal

flagellates produce a dysentery, and that they are causal agents in simple diarrhea more proof is necessary.

6. The prevention of dehydration of the tissues by the injection of normal saline is of primary importance in the treatment of severe bacillary dysentery.

7. Intravenous injection of antidysenteric serum in doses of 60 to 80 Cc. once or twice daily the first three days of treatment gives the best results.

PYELITIS COMPLICATING PREGNANCY.

The *Pennsylvania Medical Journal* for December, 1917, contains a contribution on this topic in which MILLER states that the treatment varies according to the severity of the condition. Drugs, posture, ureteral catheterization, and relief of obstruction by the emptying of the uterus all have their place in the therapy of this condition. In the milder cases or while waiting to arrange for other treatment the administration of large doses of urotropin may be tried. Miller feels that less than a drachm of urotropin daily can hardly be expected to materially influence the infection. In addition it must be remembered that free drainage of the kidney is essential, and for this the head of the bed may be elevated or the patient turned on the unaffected side. If the obstruction is caused by pressure alone this may permit of drainage and give relief. If, however, the obstruction is caused by an inflammatory swelling of the ureteral mucosa it will seldom give relief.

In cases in which pyelitis has existed for some time the obstruction is at least partially caused by the swollen mucosa as demonstrated by the cystoscope, and relief can then be obtained only by the passing of a urethral catheter.

There is no essential reason why we should hesitate to relieve the engorged ureter and kidney pelvis of its pussy contents and establish drainage. It may be done without pain, and in all cases in which the condition has not involved the kidney substance is followed by relief and in many cases by a cure. It affords an opportunity to secure and identify the organism present and have an autogenous vaccine made. Vaccines are of benefit if, in the occasional case in which the kidney and ureter are draining freely, it may be necessary to permit the catheter to remain some days or weeks; in one of Miller's cases catheter drainage was continued for six weeks, the catheter being removed only in the beginning of labor. Some months later a report from the patient's physician assured Miller that the patient's recovery had been complete. Lavage of the kidney pelvis will be necessary less frequently when drainage is continued.

In some instances it may be advisable to empty the uterus by the premature induction of labor, remembering that to do so we have to enter the uterus through an infected field with its consequent dangers. In times past this was the recognized method of treatment in the severe and resistant cases, but the necessity of doing so has undoubtedly been decreased if not entirely removed by the use of a retention ureteral catheter.

Pyelitis occurs with sufficient frequency in pregnant women to warrant its consideration when symptoms suggesting its presence are found.

A good hygienic life, a normal resistance, and freedom from pus pockets at the roots of the teeth, in tonsils, etc., are the only prophylactic measures known.

Drug and postural therapy should always be instituted as soon as the condition is suspected.

Ureteral catheterization should immediately follow any failure to get relief by the simpler methods.

Vaccine therapy in some cases seems to be of benefit after drainage has been established. Induction of labor may at times be necessary, but the increased danger due to the infection present should be kept in mind.

LOCAL TREATMENT OF FURUNCLES.

WHITNEY in *Colorado Medicine* for December, 1917, asserts that the prospective furuncle may be almost surely aborted if the following procedure is thoroughly and accurately followed: A match, or still better a similar stick made of harder wood, is sharpened to a point precisely as if it were a diminutive pencil, except that the slope is a trifle more gradual. It is then dipped into pure carbolic acid, and bored or pressed for a slight distance into the tiny vesicle—through the epidermis, of course, and into the corium beneath. This is at first slightly painful, but the anesthetic action of the carbolic acid produces a complete cessation of pain in a few seconds. The point is then dipped again in the acid, and bored still deeper, an almost painless procedure; and this is repeated four or five times until a depth of about ⅛ to ¼ of an inch has been reached. The object, of course, is to cauterize the hair follicle to its full depth. If this is thoroughly done, the furuncle will be aborted, because contact with carbolic acid is certain death to staphylococci. There will be a slight reaction from the cauterization, perhaps for the next twenty-four hours, and sometimes of such intensity as to make one doubt whether the treatment has been successful. In most cases, however, the painfulness of the papule will diminish so much in the course of eight to twelve hours as to assure success. It is evident that this procedure is available only to those experienced persons who have had at least one boil, and have been instructed how to handle a recurrence.

Now as to the treatment of a boil which can no longer be aborted; and with the method described Whitney does not believe this is possible after the first two or three hours, when the vesicle is tiny and the whole areola is about one centimeter in diameter. After the lesion has become larger, as it rapidly will, so that in a dozen hours or so it has a diameter of probably 2 cm. with a slight and gradual elevation from the periphery toward the center, and extreme tenderness, Whitney would no longer attempt to abort; it would be very painful and probably ineffectual. Whether at this time the subcutaneous injection of pure carbolic might, as he has heard, still effect abortion, he does not know; he never dared to try it. He prefers to wait about twenty-four hours longer, say thirty-six or, at most, forty-eight hours from the onset, and then to make a crucial incision.

That early crucial incision is the only correct treatment of furuncle cannot be too emphatically affirmed. There is no other possible way of effecting an early separation of the sloughing follicle; and it is only when this sloughing process has reached a certain stage that the excessively painful induration of the surrounding tissues begins to abate. The chief and practically only consideration in the treatment of a boil is the diminution and shortening of its painful course by painless procedure; and early crucial incision under cocaine accomplishes this in a most extraordinary degree.

The technique is as follows—and Whitney believes that much depends on how thoroughly it is carried out:

To anesthetize, the needle is inserted into the corium at some point in the periphery of the areola, and from this preliminary wheal three or four small shots are placed around and beneath the central papule. Two crucial incisions are then made about three-eights of an inch in length, and of at least equal depth. The cavity thus made is then packed rather tightly with gauze, care being taken to pack in such a way that the four angles are well filled. The gauze strip is then cut off at the exact level of the skin, and pressure exerted for a short time until bleeding through the soaked gauze has ceased. These details would be quite insignificant and unworthy of attention were it not for the fact that no further dressing is applied; and if the boil, as usual, be on the neck, cosmetic considerations are of great importance. This is one of the very strong points to be made in favor of this mode of treatment—a very small and not particu-

larly noticeable elevation made by the small furuncle with its central plug of dry gauze, versus the unsightly dressings which usually make diagnosis easy at the distance of half a block.

The first packing is left in for twenty-four to forty-eight hours, the shorter period being usually preferable. This first day is one of considerable pain, especially the first two or three hours following the incision, for which a small opiate is not always superfluous. Since fresh packing can easily be applied by the patient or some member of the family, if necessary, particularly because all except the first should be rather loose, some relief may be sought, and often with success, by a change of packing at the end of the first twenty-four hours, this relief being probably due to diminished pressure. But in forty-eight hours at the latest, whether because of the changed packing or coincident with it, a marked improvement occurs, and from this time on the pain in the boil itself, and particularly the wide and painful infiltration and consequent acute tenderness and immobilization of the surrounding tissues, rapidly diminish. The third packing, at the end of another twenty-four hours, or about three days from the time of incision, will disclose a white slough, which twenty-four hours later will probably be found adherent to the packing and come away with it. A fresh packing, however, is inserted daily until the cavity has closed, chiefly for the sake of looks. During the whole treatment no dressing other than the packing is applied.

In closing, Whitney would emphasize a trifle more strongly by comparison the advantages of this early crucial incision. There is nothing like severe pain for more than the following two or three days, and even during this period the pain is far less than when the lesion is allowed to take its natural course. For then pain steadily increases, the surrounding infiltration extends so that literally the whole neck becomes involved in a constantly increasing agony with every motion of the head, and sleep often becomes almost impossible for many nights. When such a course, with the eventual incision of what has become a large and excessive painful abscess, is compared with that of early incision, the difference is seen to be enormous. Convalescence actually begins in two or three days; for after that length of time motion of the neck is almost painless, and there is a general "loosening up" of all the tissues, as the writer always used to express it, and sleep is no longer disturbed. When to this is added the avoidance of all cumbersome dressings, and particularly the greatly diminished danger of further infection which comes from the spreading of pus by poultices or even any flat dressing over a profusely suppurating abscess, it would seem that the advantages of this method are incontestable. Whitney has said nothing about curettement because it is not often indicated when an early crucial incision is made.

SOME OF THE NEWER METHODS OF TREATING WOUNDS.

MATTISON (*Medical Record*, Dec. 1, 1917) after alluding to the application of general surgical principles to wounds in war mentions continuous irrigation by the drop method with Dakin's solution and sodium hypochlorite, or with Wright's hypertonic salt solution (citrate of sodium 1 part, sodium chloride 4 parts, and water 85 parts), or continuous immersion in antiseptic solution of acetate of aluminum.

He states that the most satisfactory antiseptic in use seems to be Dakin's fluid. A solution of proper strength should contain from 0.5 to 0.6 per cent of hypochlorite of soda. The method of preparation given is that not controlled by tests and includes the addition of boric acid with the neutralization of alkaline reaction. It is observed that this solution should not be used at the same time as alcohol and should never be warmed.

As to the method of procedure, the drip is said to be the best. Sir Almroth

Wright advises at the first-aid post after cleansing, bandaging and splinting of the wound, injection of antigangrenous vaccine, that is one containing bacillus of Welch, to which there should be an immediate immunizing response. At the field ambulance the wound is thoroughly surgically cleansed and drained and tetanus antitoxin is injected. For the purpose of drainage loops of sterile bandage previously steeped in a solution of 5-per-cent sodium chloride and 0.5-per-cent sodium citrate are carried down into the wound as wicks after preliminary syringing out with hypertonic salt solution. The ends of the wick are to be inserted between plies of lint well soaked in the same solution, and folded over so as to form a thick pad; one or two tablets of salt are placed in the dressing to keep the solution of proper strength when the lymph commences to flow, and over all an impervious protective dressing is placed. Wright claims that salt as a lymphagogue has no equal; 5-per-cent salt solution prevents clotting of blood, but not in the presence of pus; the addition of the citrate of sodium prevents clotting of blood in the presence of pus.

Treatment at base hospitals consists of what he calls the full programme of phylacogogic treatment. Cases of spreading infection, cellulitis, and gaseous gangrene are treated by free incision, supplemented by hypertonic salt solution until tissues are restored to their normal condition; then merely the surface is irrigated with a physiological salt solution until all infections are extinguished; then secondary suture of wounds, then irrigation with 5-per-cent salt solution or Ringer's or Lock's solution (without sugar). The use of antiseptics and antiseptic precaution in all wounds is insisted upon, Wright holding that the value of antiseptics is due to their production of a flow of serum.

Cheyne objects to Wright's hypertonic salt solution of 5 to 10 per cent, and contends that "brine" is good to preserve dead tissue, but is bad for live ones. Cheyne strongly urges the principles of Lister in the treatment of wounds, and holds that in recent years a most unaccountable prejudice has arisen against antiseptics, with the result that students have not been educated in their use—indeed, have been taught to decry their value and to look on them as old-fashioned and very objectionable substances. Cheyne recommends a strong antiseptic, Lister's strong mixture 1/20 carbolic lotion, to which is added sufficient bichloride of mercury to form also a 1/500 bichloride solution, in the early stages, but uses very weak antiseptics, if any, in the later stages. He also favors borsal (equal parts of boracic and salicylic acid), or a paste containing carbolic acid or cresol and borsal.

Browning considers that the bactericidal substance must have a great potency against all organisms in the presence of protein material, such as serum; it must be stimulating to granulation; it should have no deleterious effects on phagocytosis, no irritating action on tissue, and no toxic effect on the more highly specialized cells. The preparation they call flavine is regarded by Browning and his coworkers as experimentally promising most since it is twenty times as powerful as corrosive sublimate and eight times as much so as carbolic acid.

Delbet uses 12-per-cent solution of magnesium chloride for irrigation, for dressings, and for subcutaneous injections. This fluid has over ordinary antiseptics the advantage of respecting the cells.

Rosenblith commends magnesium chloride and sodium iodide. Ingram, in deep infected wounds, employs the silver nitrate stick very thoroughly, and follows this by hot fomentations. He claims the wounds so treated clean up more quickly than after any method he has tried.

Duggan uses equal parts of ichthyol and glycerin applied with a camel's-hair brush.

Lockwood advises Murphy's treatment in infected knee-joints. He injects a 2-per-cent formaldehyde solution in glycerin (made up at least twelve hours before and not more than seven days old), about 2 drachms being used; or he employs ether and iodoform, pure ether, or 5-per-cent sa-

line solution. In fresh cases after complete excision of the wound, with proper change of tools, the capsule is stitched without drainage in the cavity of the joint. Proper splinting is invariably called for. The points he lays most stress on are that all foreign bodies, whether metal, loose bone, or clothing, should be removed from the knee-joint at the earliest possible moment. Perfect immobilization is absolutely necessary; do not start passive motion too early, wait at least three weeks after inflammation has subsided. Absolutely complete excision of all necrotic or even edematous tissue. The capsule should be closed at the first operation if at all possible. Antiseptics other than those mentioned are never introduced into the joint. Tubes should never traverse the joint surface.

Crile has employed the Winchester Doubouchet method of treating wounds by the use of Dakin's solution and electric light, the lights being placed such a distance from the patient as to be comfortable, the infected wounds being exposed to the light without dressing, and wound secretions cleaned with Dakin's or Wright's solution. Frequent cleansings, as called for, with acetate of aluminum solution, when there is too much moisture; or the use of Wright's solution to promote secretions when such wounds become too dry from lack of serum.

Rutherford Morrison has used a paste composed of iodoform 2 ounces, bismuth subnitrate 1 ounce, liquid paraffin enough. This can be made of any consistence, usually that of soft butter or thick cream. The wound is previously swabbed out with alcohol and a small portion of the paste (not to exceed 2 drachms) is vigorously rubbed into the tissue, a little being left in the bottom of the wound. No dressing is required for seven to fourteen days. Morrison claims that this paste exerts a continuous antiseptic action on the wound. It acts as a lymphagogue, and a free exudation of serum washes the wound from within outwards. It does not prevent the escape of discharge. Granulation tissue grows freely in contact with it. Drainage tubes and gauze drains are unnecessary. Septic wounds heal nearly as rapidly as non-infected ones. Bone union is rapid and the tendency to form sequestrum is slight.

Lewis makes hypochlorous solution electrically from hypertonic salt solution. He describes a very simple apparatus for its production from sea water and claims it is much more potent than the solution as ordinarily made, and wounds treated with the solution produced by electrolysis have given better results.

FAT EMBOLISM FOLLOWING TRAUMA TO BONES.

CALDWELL and HUBER (*Surgery, Gynecology and Obstetrics*, December, 1917) as the result of an experimental investigation report as follows:

Crushing the tibias of mature rabbits produces a moderate and fairly constant amount of fat embolism, as determined by counting the fat droplets in a large number of representative microscopic fields, in stained sections of lung tissue.

Esmarch constrictors placed on the legs of rabbits, previous to the crushing of the tibias and removed after two hours, lessen distinctly the amount of fat entering the lungs during the remainder of the experimental period; this effect is much less marked and more uncertain when they are removed at the end of a half-hour or even one hour.

The amount of fat embolism which develops after the removal of the constrictors is dependent largely upon the activity of the animals.

Rabbits kept in chloral hydrate narcosis during the entire experimental period, following the crushing of the tibias, develop only a small amount of fat embolism although the constrictors are not used.

The removal, by means of a motor saw, of splints from the tibias of normal dogs and rabbits produces an appreciable but a very small amount of pulmonary fat embolism.

The use of the chisel for the removal of

the tibial splints from dogs increases very slightly, if at all, the amount of fat entering the circulation.

The spinal part of the Albee bone transplantation operation, on normal rabbits, produces more fat embolism than does the tibial part.

TREATMENT OF ACUTE GONORRHEA IN SOLDIERS.

CARLE (*Practitioner,* November, 1917), who is in charge of the venereal hospital for the 10th Army, has published the details of the method he has adopted for the treatment of the very large number of patients passing through his hands.

It is essential that the treatment should be prompt, simple, intensive, and easily controlled. After many attempts he succeeded in reducing the time necessary for cure from an average of forty days to one of twenty-four days by use of injections of permanganate of potash.

In the absence of lymphangitis, definite cystitis, or bleeding from the urethra, he prescribes injections of permanganate of potash, 25 cg. to the liter, three times a day, whatever the date of onset may be or however profuse the discharge. He takes particular care about the way in which the injection is made. After the patient has micturated, the meatus is washed out; and then, by a series of lavages, the anterior urethra, the fluid being allowed to pass as far as the sphincter and emitted at once. An actual injection is then given under pressure and retained for two or three minutes in the canal. This procedure is followed until the discharge stops completely, which usually happens in about ten days. This, however, does not imply that the cure is yet complete.

Carle insists upon three injections being given each day, and arranges the times for these in accordance with the patient's military duties. He draws particular attention to the fact that during this first period of treatment injections are given, and not a copious washing out of the bladder and urethra. He condemns unsparingly the prevalent method of freely washing out the bladder and urethra once each day, for he considers it to be much too dangerous for adoption, at any rate in treating large numbers of cases.

To complete this first period six or eight capsules of sandalwood oil or copaiba should be taken each day, especially if the patient has a tendency to urgent micturition or passes cloudy urine. In the latter case he should be put upon milk; otherwise, with the exception of stopping all wine, no difference is made in the diet.

With the cessation of the discharge, the painful micturition and the local signs of urethral inflammation will have passed off, and a change is made in the procedure. The morning injection is replaced by a copious washing out of the bladder and urethra with a solution of permanganate, 0.1 cg. to the liter. This is entrusted to a trained attendant. The resistance of the sphincter is usually overcome after one or two attempts. In some cases a previous injection of cocaine is necessary, but it is more advisable to continue the previous treatment by injection and the balsams. For the other two injections in a day, the permanganate is replaced by a silver salt. After micturition and urethral lavage, an injection of nitrate of silver, 1 in 1000 to begin with but increased as quickly as possible to 2 or 3 per 1000, is given at midday and in the evening. This should be retained for two minutes at first, but this time must be increased by degrees up to five or six minutes. These injections are given under the superintendence of a trained attendant, and their retention is considered to be quite as important a feature of the treatment as their repetition.

As to the length of time for which the treatment should be kept up, this second stage should always be continued for longer than seems necessary. An average of from twelve to twenty days, more rather than less, is necessary. After a week a cure has apparently been established, but a relapse will certainly occur if the treatment is left

off. The length of time varies according to the stage at which treatment was first begun. If the discharge had already been present, without complications, for a month, the time required will be shortened, but if treatment is begun during the first week of the disease a longer time will be necessary. In any case not less than from fifteen to twenty days should always be allotted to the second stage of the treatment.

It is advisable to stop the injections three or four days before the patient is discharged as cured.—*Journ. de Méd. et de Chir. Prat.*, Aug. 25, 1917.

GUNSHOT WOUNDS OF THE KIDNEY AND URETER.

FULLERTON *(British Journal of Surgery,* Volume V, No. 18, 1917) bases his paper on 42 cases seen at the base. He has excellent colored illustrations of pathological specimens. X-ray examinations of foreign bodies has afforded him means of constructing the track of the missile, and he records the following signs and symptoms:

Hematuria, which may be microscopic, moderate, or profuse. It is well in a doubtful case to ascertain that the blood is not coming from the bladder, as is so frequent in associated injuries to the spine with hemorrhagic cystitis. He has seen splashes of hemorrhage scattered over the bladder wall in a case in which a piece of shell had injured one of the lumbar vertebræ without involving the cord; until cystoscopy had revealed hemorrhage into the mucous membrane of the bladder, the case was thought to be one of injury to the kidney or ureter. It is well also to bear in mind the possibility of hemorrhagic cystitis unassociated with spinal injury, as the author has seen several examples in unwounded men coming down from the front. Other causes of hematuria independent of injury will, of course, suggest themselves to the surgeon.

In some cases a watery discharge from the wound has been mistaken for urine. A little care is sufficient to prevent such an error. It is well to test such fluid with litmus paper, and to examine for the characteristic urinous odor from the dressings.

In addition to these special signs indicating renal or ureteric injury, the following are often present:

Shock is frequently met with, and may be due to accompanying injury to the abdominal viscera, thorax, or spine.

Anemia after profuse loss of blood is often very marked in a patient when he reaches the clearing station or the base.

Vomiting was reported in about 25 per cent of the cases. It may have been more common. It occurs in uncomplicated cases, but is much more likely to be present when the abdominal viscera have also been injured.

Tenderness and rigidity of the abdominal wall are present in most but not all of the cases. These symptoms may be due to injury of the peritoneum, injury to the abdominal viscera, injury to the pleura and diaphragm, blood in the peritoneal cavity, or retroperitoneal hematomata. In some of the reports sent down with the patients from the clearing stations, the definite statement has been made that on arrival there tenderness and rigidity have been absent.

Abdominal distention is frequently met with, as might be expected. In those cases associated with spinal injury it is very likely to be present. Dulness in the flanks has occasionally been seen. A tumor in the flank, due to perirenal extravasation of blood, is sometimes palpable. This may be a sign of importance in certain transverse wounds in which it is not easy to locate the kidney affected.

Fever may be present, and is due to the fact that many of the wounds are septic.

The three great complications of injuries to the kidneys and ureter are sepsis, secondary hemorrhage, and uninary fistula. Retention of urine was present in eight cases, in six of which it was due to associated spinal injury.

Fecal fistula was present in two cases. In one the fistula soon closed, and the

patient, who subsequently had nephrectomy performed for secondary hemorrhage, made a good recovery. In another, also, nephrectomy was performed for secondary hemorrhage; this patient died a few days later from sepsis. The presence of a fecal fistula would appear to predispose to secondary hemorrhage.

Infection is likely to occur in kidney wounds for the following reasons: A large amount of blood is thrown out into the loose perirenal connective tissue. Both blood-clot and loose connective tissue are notoriously favorable to the development of infection, once microörganisms are introduced. Owing to the absence of collateral circulation in the kidney, a certain amount of gland tissue in the immediate vicinity of the wound dies. This dead tissue forms a suitable medium for the growth of microorganisms. If the adjoining colon is bruised or damaged, the entrance of intestinal microörganisms, or feces, transforms the wound at once into a septic one.

Bleeding from a wound of the hilum or of the kidney itself may take place (*a*) into the peritoneal cavity; (*b*) into the perirenal retroperitoneal tissues; (*c*) through the wound in the parietes; and (*d*) into the bladder by way of the ureter. Bleeding into the peritoneal cavity may occur in the early stages, but is not commonly met with at the period when the patient reaches the base.

When blood infiltrates the retroperitoneal connective tissues, it often gives rise to a huge mass which, on exploration, looks like a bullock's heart. This mass moves with the kidney during respiration, and sometimes becomes rounded off, so that an operator meeting with it for the first time might mistake it for a greatly enlarged kidney. To reach the kidney it is necessary to peel off this overlying infiltrated fleshy mass.

Hemorrhage is sometimes revealed by bleeding through the external wound, though the urine appears to the naked eye to be clear. This may be due, as Sir George Makins suggests, to a fragment of kidney substance obstructing the ureter, or more commonly, to blocking of the ureter with blood-clot.

Secondary hemorrhage of a severe type took place in nine cases out of a total of 42 reaching the base. Leaving out of the total two cases in which the ureter alone was involved, this gives a secondary hemorrhage percentage of 22 in the cases in which the surgeons at the clearing stations felt justified in adopting conservative measures. In some of these the injury appeared to be of quite trivial nature, as in a case in which a simple perforating wound by a bullet was followed by repeated attacks of hemorrhage, finally requiring nephrectomy. In eight out of the nine cases nephrectomy was performed, with three deaths; in the ninth case nephrectomy was not considered necessary, and the patient died from other wounds. In a case of intraperitoneal secondary hemorrhage which took place and was followed by death, the hemorrhage was unconnected with the kidney or its vessels.

It must be admitted that the treatment of secondary hemorrhage from the kidney or its vessels is highly unsatisfactory. The canon of surgery in other parts is to expose the bleeding vessel and tie both ends in as healthy a spot as available. Even if the vessel in the kidney giving rise to the bleeding could be identified and dealt with, the inevitable necrosis of its area of supply would be a matter of importance, should sepsis extend to it. There seems, up to the present, to have been no middle course between temporizing and ablation of the organ itself. Sir George Makins, in an article dealing with gunshot wounds of the solid abdominal viscera, referring to cases seen by him at the base, says: "In none of these cases was a limited operation justifiable." This opinion is founded on the fact that a partial operation is not likely to remove the primary cause of the bleeding, viz., infection. Hence it is not right to expose a patient already grossly anemic to the risk of a fresh hemorrhage from a sutured or partially resected organ.

If the surgeon is satisfied that the patient

has another sound, efficient kidney, his safest course will probably be to remove the offending organ.

FRACTURES OF THE NECK OF THE FEMUR IN CHILDREN.

TAYLOR (*New York State Journal of Medicine*, November, 1917) has noticed several different types of this injury in children, each rather characteristic of the age at which it occurs. In young adults the break is usually near the middle, or near the head, with upward displacement and outward rotation of the distal fragment, and complete disability. The leg usually atrophies, and in such cases removal of the head may give an excellent result, the stump of the neck resting below the upper end of the acetabulum. These cases if seen early should be reduced completely under ether and a long spica plaster should be applied in abduction.

In adolescents, the usual injury is the slipped epiphysis, or epiphyseal separation, in which the history, clinical picture, and roentgenograms are characteristic. The typical age for this injury is twelve to sixteen inclusive. Cases outside of these limits are often physiologically within them, though there are exceptions. The neck and shaft of the femur may slip slowly upward at the epiphyseal line without trauma in rapidly growing adolescents of overgrown, obese, and flabby type, and in such cases the deformity is often bilateral. Many of these cases are suffering from hypopituitarism or other glandular dystrophy. In the traumatic cases this same type may be found, especially in those instances where both hips are involved in succession. The injury causing the displacement and disability is almost regularly preceded by a moderate fall, which apparently starts the epiphyseal junction and makes subsequent separation easy. Two injuries with a few weeks interval, and a little or moderate disability after the first, are the rule. The leg is flexed and everted, and may be adducted. The patient is often able to walk, limping badly, even after the second injury. The displacement should be carefully reduced at once under ether, and this is often difficult. Cases seen after three or four weeks may be impossible to reduce without an open operation.

The writer's material includes one case of impacted fracture through the middle of the neck, with very slight displacement, occurring in a girl of thirteen. When seen three and a half weeks after a short fall, the patient was practically symptomless, but did not walk on account of a knee long ankylosed in flexion. She was kept in bed and afterwards walked on crutches, as she had before the fall.

The characteristic injury in children under thirteen is a fracture at the base of the neck, at its junction with the shaft and trochanter. It is a transverse fracture without displacement, or with only an angular displacement in adduction, to which outward rotation is added in some cases. The writer ventures to propose for this injury the name of "hinge fracture," as the periosteum under the neck acts as a hinge, permitting angular displacement in adduction, but preventing displacement *en masse*. If there is no displacement, there is no shortening or deformity and the symptoms may be mild; the treatment is a plaster spica and crutches. The line of fracture may be gaped open at the top by the original injury—probably an adducting force—or by walking on the injured limb; if this occurs, the proximal fragment is brought into the coxa vara position, which, if not corrected, will be permanent. The treatment is correction of the deformity, which in recent cases may often be done without ether, and fixation in abduction by a plaster-of-Paris spica from the chest to the toes.

Fracture of the neck of the femur may occur at any age.

The typical fracture of the neck of the femur in children up to thirteen is a hinge fracture at the junction of the neck and shaft. This fracture is one cause of coxa vara.

From thirteen to sixteen, the typical in-

jury is a fracture at or near the epiphyseal line, with marked displacement.

Above sixteen, the type of fracture of the femoral neck does not differ from that in adults.

WOUNDS OF THE KNEE-JOINT.

MOYNIHAN (*Boston Medical and Surgical Journal*, Nov. 22, 1917) pertinently observes that too often in the early stage of the war the surgeon neglected to consider that men had two legs and only one life and that conservative measures were pushed to the extreme. In the work of the French army amputation was in such circumstances often advocated and practiced forthwith. On the other side some legs were amputated that might have been saved, but many lives were rescued that would otherwise have been jeopardized or lost. It was quickly realized that all methods of treatment of a well-established purulent arthritis were miserably inefficient, and that here, as elsewhere, every effort must be directed to such a precocious and drastic treatment of the wound as would prevent the development, never long delayed, of an infection. The aim must be to save the patient and his damaged articulation.

For purposes of academic description, the following classes of injury may be recognized: Cases of clean perforating wound of the knee-joint by rifle bullet. These wounds are readily sealed up and present no evidences of inflammatory reaction. The joint may or may not fill with fluid in the next few days. This fluid, if removed, will usually be found to be sterile. In such cases the joint is immobilized and the patient retained if possible at the clearing station, so as to avoid the disturbances often inseparable from travel. Aspiration of the fluid, and the injection of formalin and glycerin, formerly often practiced, do not seem to insure or to hasten the recovery.

In cases of penetrating or perforating wound of the joint, or both, when the projectile is retained in the joint operation is always indicated. Invariably an *x*-ray examination should be made. The wound of the projectile track is excised, the missile removed, and the fragments of bone sacrificed as appear to be necessary. Moynihan believes that preliminary sterilization of the tract with an actual cautery is an undoubted advantage. Freedom of approach is needful. Section of the ligamentum patellæ may be required. The projectile if small remains embedded in the articular ends of the bones; when the bone has suffered little or no damage beyond that necessarily inflicted by the entrance of the foreign body, it becomes encapsulated and rarely gives rise to subsequent trouble. If a projectile, however small, remains in the knee-joint, it is an abiding source of infection and of suppurative arthritis. All vessels bleeding ever so slightly along the wound must be carefully secured, and if the surgeon desires some form of antiseptic he may use either Dakin's solution or saline solution. The wound is then closed layer after layer by catgut sutures until the skin is reached. For this, silkworm-gut is used.

Any form of tube introduced into the joint cavity in the early cases is productive of nothing but evil. The tube should never be placed within the joint. Where drainage is indicated tubes may be introduced down to the joint. Absolute immobilization is essential. In 10 to 15 per cent of these cases an elevation of temperature occurs, usually after the fifth or sixth day. An examination of the fluid discharged from the tube or removed by aspiration from the joint is then made. If any organisms but the streptococcus or staphylococcus are found, there is no need as yet for anxiety. In quite a number of cases the fluid will prove to be sterile and will leak away by slow degrees through the aperture prudently left in the synovial membrane. Day by day the temperature will fall, the knee assuming its normal size. If, however, the staphylococcus is found, the joint must be watched almost from hour to hour. If fluid is leaking away slowly, and if the temperature tends to fall, and if the patient remains comfortable, then expectant meth-

ods may safely be continued. When the streptococcus is present, active and timely interference is necessary. The joint must be freely opened by long lateral incisions or by semicircular incisions dividing the patellar ligament. The synovial membrane must be stitched to the skin and the Carrel-Dakin method adopted. If the infection is of a still graver or more hostile kind, excision of the joint or even amputation may be imperatively necessary.

In cases of perforating or penetrating wounds of the joint with intra-articular fractures the bone is often broken into many jagged, irregular pieces. There is call for ruthless surgery. Free incision and thorough mechanical cleansing, removal of all loose fragments, sparing as far as possible the articular cartilage, changing gloves, towels and instruments as required by ordinary surgical principles, with perfect hemostasis.

Moynihan states that he has seen several cases of severe infection of the knee treated by bipp, smeared over the rough osseous surfaces, or inflamed synovia, in which there was good functional restoration. Timidity toward the knee-joint is needless. With proper care it can protect itself against infection almost as well if not quite as well as the peritoneum. Drainage if necessary is secured by tubes down to the synovial membrane, but not within it, by suturing the synovial membrane to the skin, or by adopting, as Mayo Robson suggests, a special posture of the limb.

In cases of injury to the knee-joint, with extensive fracture of the articular ends, the practice to be followed will depend upon the position and extent of the injury, the number and localization of the projectiles, and the degrees of infection. If there is extensive fracture without loss of tissue it is probable that an attempt to save the knee will be worth while. When, however, there is extensive localized loss a formal resection of the knee-joint is probably the best course; this from the standpoint of ultimate function. As much of the femur must be saved in making the resection as can with safety be left; the upper end of the tibia, if intact, must have only the merest shaving of the articular cartilage excised—that is, enough to allow a bony ankylosis to take place. Where infection has obtained a hold the Fullerton method of excising may be practiced. Instead of bringing the opposing ends of the tibia and femur together, means are taken for bringing them apart. A wide gap then is left which may be filled lightly with gauze and the Carrel-Dakin method of treatment adopted. When the wound has reached the stage of "clinical sterilization" the bones may be fitted together and the limb fixed in a splint.

In still more severe types of injury amputation of the thigh is performed without delay. This counsel is especially urgent when the great vessels also are injured, when laceration of the soft parts is extensive, and when infection, especially with the bacillus of gas gangrene, is evident.

SPINA BIFIDA.

BECKMAN and EDSON (*Saint Paul Medical Journal,* December, 1917) regard spina bifida as a hernia from the spinal canal due to an excess of pressure in that canal in intra-uterine life. Such hernias occur at the point in the canal where ossification of the vertebræ takes place at a late period of development.

As a conclusion to this paper these authors state that spina bifida is caused by increased cerebrospinal pressure rather than by bony defects in the arches of the vertebræ.

The age of patients most suitable for operation is from nine months to two years.

At the time of operation the spina bifida should be free from infections which may be due to abrasions of the skin or leakage of the spinal fluid.

As a general rule, paralysis associated with the spina bifida remains unchanged by the operation.

Spina bifida associated with hydrocephalus should not be operated on until the hydrocephalus becomes stationary or the

pressure is relieved by some operative procedure.

It is not advisable to operate on adults unless they are having serious trouble, since the mortality will be high because of the frequency of necrosis of the skin-flaps and of meningitis.

POSTOPERATIVE THERAPEUTICS OF SURGICAL INFECTIONS.

Cocci (*Surgery, Gynecology and Obstetrics,* January, 1918) avoids the use of antiseptics, and excepting in cases of unusually severe infection, with special pathology, uses heat. As a mechanical cleanser he prefers hot sterilized water. He abolishes also drainage by means of gauze, or india-rubber, or a combination of these substances, excepting in very large cavities produced by abscesses. Instead of drainage he introduces into the suppurating wounds previously sterilized paraffin, with a melting point at 48° C., liquefied by heat. The paraffin is applied with a large glass syringe and is carried to the smallest and most remote recesses of the wound, the latter being completely filled up to the level of the skin. Around the wound previously sterilized white vaselin, which has been kept soft and ready for use by means of heat in a water-bath, is liberally applied.

TREATMENT OF WAR WOUNDS.

Besley (*Surgery, Gynecology and Obstetrics,* January, 1918) states that he has attempted to give the antiseptic treatment a fair trial. This statement applied in the main to the Carrel-Dakin treatment and the use of "b. i. p." He expresses himself as strongly opposed to the packing of freshly infected wounds with gauze. He quotes Lieutenant Glaspel to the effect that of 100 cases which came to the hospital treated with "b. i. p.," 28 showed distinct evidences of poisoning from bismuth as manifested by the blue line on the gums, stomatitis, and constitutional disturbances; 19 per cent had an acute hemorrhagic nephritis with large quantities of albumin, casts, and red blood-cells in the urine. In the old infected wounds drainage was insisted upon. It is best secured by free incision of all cavities containing pus, these cuts being so made as to prevent further pocketing. Rubber tissue or paraffin gauze is preferred to tubes where drainage is indicated. Doubt is expressed as to the value of any irrigations. Baths and hot moist dressings are advised; this in the first twenty-four hours. Thereafter wounds are exposed to the open air, with no dressing whatever in contact with its surface for at least twenty hours out of the twenty-four. During two periods of two hours each, within the twenty-four hours, the wound is covered with hot moist dressings or immersed in a hot bath.

It can be understood readily that these wounds must be protected from flies by necessary screens, and preferably should be kept warm with an electric light beneath the screen, if that be available.

If one is contemplating closing these wounds by secondary suture, for the purpose of shortening convalescence, he believes that granulating surfaces may be sterilized by the Dakin solution properly applied.

TUBERCLE BACILLI IN THE URINE.

Spitzer, Williams, Burdick and Craney (*Interstate Medical Journal,* October, 1917) in an intimate study of the subject announce that the normal epithelium of the human genito-urinary tract does not excrete tubercle bacilli.

When tubercle bacilli are found in the urine a tuberculous lesion exists somewhere in the genito-urinary tract. This lesion should be found, otherwise the patient should be kept under observation until it is.

Since the early diagnosis of tuberculosis of the genito-urinary tract, particularly of the kidneys, is of the greatest importance if the patient is to be benefited, it is advised that the urinary sediments of tuberculous patients be injected into guinea-pigs as a matter of regular routine.

Of the 100 cases of pulmonary tuberculosis examined by the authors, only four showed the presence of tubercle bacilli in the urine, and three of these were proven to have tuberculous lesions in the genito-urinary tract.

Whereas the majority of patients suffering from tuberculosis of the kidney consult the writers for their bladder symptoms; and since their bladder symptoms are caused by tuberculosis of that organ, secondary to tuberculosis of the kidney; and since, in a large number of these cases, after removal of the kidney, the bladder does not heal spontaneously (we formerly supposed it did); and since there is no method of curing it; therefore, it is essential that we prevent tuberculosis of the bladder. This is possible only by diagnosing tuberculosis of the kidney before the bladder becomes affected, *i.e.*, in the vast majority of cases, before there are any symptoms, and this in turn is possible only by the routine injection of the urine of patients suffering from tuberculosis anywhere in the body into guinea-pigs every few months.

INJURIES OF THE PERIPHERAL NERVES AND THEIR TREATMENT.

MOYNIHAN (*British Medical Journal*, Nov. 3, 1917), after summarizing the nature of nerve injuries and tabulating their relative frequency, notes that the following points in clinical histories are investigated: Date of injury; nature of projectile; position of patient at moment of injury; immediate effects; after-history (including history of operations performed).

Physical examination consists in—

A. Inspection of the limb, to note:

1. Attitude, contractures (claw hand, etc.).

2. Position of wounds and scars.

B. Testing of the efferent impulses:

1. Motor weakness for paralysis, each muscle and each muscle group tested separately.

2. Trophic and vasomotor disturbances; non-shedding of epidermis, "glossy skin," ulcers, changes in nails, etc.

3. Changes in deep tissues: for example, muscular atrophy, fibrillation, bone decalcification, etc.

C. Testing of the afferent impulses:

1. Pain, its character, distribution, relation to hot and cold applications or weather.

2. Loss of cutaneous sensibility, tested by standardized stimuli of special instruments so that results are strictly comparable:

Light touch.

Localization of spot touched.

Tactile discrimination (pressure, texture, etc.).

Stereognostic sense (size and shape of three dimensions); appreciation of compass points applied simultaneously.

Thermal stimuli (hot and cold test-tubes).

Painful stimuli (pin-prick controlled by standardized spring).

Roughness (Graham Brown esthesiometer).

3. Deep sensibility.

Pressure pain.

Vibration sense in bones.

Joint and muscle sense, etc.

The main difficulties encountered in arriving at an exact diagnosis were in cases in which there were wasting and stiffness from disuse; circulatory disturbances; contractures; destruction or adhesion of muscle and tendon.

Operation was decided upon in the following circumstances:

In cases of complete division; in cases of incomplete division, where progress is arrested; where there is severe neuralgic pain, "causalgia."

Operation is deferred:

For one month after the closure of the wound where the soft parts only are injured. For two or three months after complete closure of the wound where bone has been involved. Definitely so long as progressive signs of recovery in nerve functions continue.

The suture of the nerve may have to be delayed until unsatisfactory joint conditions are improved.

Contractures of the knee, for example, should be corrected before the sciatic nerve is sutured, otherwise the nerve would be in danger of rupture if the deformity were subsequently rectified.

In other cases the nerve may be sutured and the joint dealt with at the same period and subsequently.

It is of the first importance to start active measures to prevent or remove stiffness and deformity in the parts supplied by a wounded nerve. This can often be done for many weeks before it is possible to repair the nerve. It is not sufficiently realized that a nerve to be of use after suture must act upon live and supple tissue. Joints and muscles must be kept ready for the nerve impulses which some day will come to them again.

When the diagnosis of a nerve lesion requiring operation has been made, the earliest prudent occasion must be chosen for operation. In both the French and British armies nowadays the suture of a divided nerve is performed in those most advanced operating centers where the first deliberate toilet of the wound is possible. It is realized, of course, that very often a complete union between the severed ends cannot result, but even if the operation proves eventually to be a complete failure the subsequent operative procedures are certainly easier, and it is a satisfactory thought that a chance has been given for healing to take place.

In the great majority of nerve lesions dealt with up to recent times the wound inflicted by the projectile has suppurated. We have learned by bitter experience in this war what this means. It means that the bacterial flora in such a wound are numerous, and potentially at least of great malignancy. It means that even a simple operation upon a wound which still discharges pus may arouse a flaming infection and be a cause of tetanus or gas gangrene. Mere passive movement of a joint grown stiff by inactivity may bring about an attack of tetanus even though the adjacent wound has healed. In many cases an injury to bone may have been inflicted at the same moment as the division of the nerve; this is, of course, frequently the case when the musculospiral nerve is implicated. Many loose pieces of bone may remain as sequestra in the wound and may need removal or may escape spontaneously from time to time. In all such cases operation upon the nerve must be deferred until the wound has been soundly healed for some weeks; no rule is more binding upon the surgeon than that. During this period, which may be protracted, the most diligent attention must be given to the limb, especially to those parts, muscles and joints, distal to the injury. The paralyzed muscles must be kept in a position of relaxation. This may be easy, as in those cases in which the musculospiral nerve is divided; it is often difficult, as in cases of injury to the median nerve; it is sometimes impossible, as in dual or triple lesions of nerve trunks. But, difficult or easy, the best possible must be done, for the final functional result in respect of quality and of rapidity depends in no small degree upon the early care of the parts deprived of their nerve supply.

Special and unremitting attention is given to the joints, which must always be kept supple. It is remarkable how quickly the fingers, for example, become so stiff that forced movement is an agony. Every day, many times a day, all the paralyzed parts must be freely moved to their full range, and the patient must be instructed to attend to this matter unceasingly. The most perfect nerve healing is robbed of its value if, through long disuse, the muscles whose innervation is restored have lost their power to act, and if the joints are so firmly ankylosed that even passive movement cannot bend them fully. The value of these preliminary and preparatory measures cannot be overestimated.

The incision is designed to fall on the skin at some distance from the original wound if possible; very often a flap will occur from the making of a curved incision. The planning of the incision gives scope

for one's knowledge of anatomy; it is so arranged that no small nerves are wounded. Major Jamieson has shown that when the median nerve is injured in the forearm it may sometimes be more thoroughly and successfully dealt with from the outer instead of from the inner side of the flexor carpi radialis. So, too, when the musculospiral nerve has been injured high up on the outer side of the forearm, Dr. Cuthbert Morton suggested that instead of cutting through the outer head of the triceps it should be reflected complete from the humerus. Not only does this cause less damage to the muscle tissue, but it also exposes the nerve and its branches, as well as the profunda artery, to a very high level without undue risk.

When the injured part of the nerve is exposed, it is usual to find a bridge of fibrous tissue between the ends, the proximal end being often very turgid and bulbous. If the gap between the refreshed ends of the nerve is likely to be wide, now is the time for stretching the nerve, so as to lessen the interval as much as possible. This is done with infinite gentleness and care by seizing the fibrous band between the ends and drawing steadily upward and downward, always remembering to make the pull in the line of the nerve trunk and to avoid twisting. The fibrous band is now split longitudinally, and then its ends are divided above in one direction, below in the other, so that to each cut end of nerve a fibrous tag is attached, by means of which the nerve ends can be drawn together. Progressive transverse cuts are now made into the nerve ends until on cross-section nothing but nerve fibers are seen. Every tiniest particle of fibrous tissue must be removed or the operator will fail. The axis cylinders coming from above must have free entry into the nerve below, otherwise in their downward development they will lose their way, and restoration of the nerve function will not take place. When the nerve ends are duly prepared they are brought into apposition with the greatest care. A series of very fine catgut sutures holding only the nerve sheath are inserted at intervals round the circumference of the nerve. A suture is never passed through the substance of the nerve itself. In uniting the nerve ends it is of the first importance to avoid axial rotation.

There is rarely any difficulty in obtaining accuracy of apposition without tension. If, however, the nerve ends cannot readily be brought together, various procedures may be adopted to shorten the course of the nerve. The nerve may be dislocated from its bed and laid in a new and shorter line. The ulnar nerve, for example, may be brought to the front of the inner condyle. Or flexion of the limb may be enough to allow of easy approximation. In the case of the median nerve divided low in the forearm, flexion of the wrist will give an inch or more additional reach. In other cases the limb may be shortened by removing an inch or two of bone. It is desirable to avoid a subcutaneous course in all transferences to new positions. The nerve after suture should be brought to lie in a bed of healthy tissue. It must be placed between muscles, and away from all contact with new connective tissue, which will adhere to it and hinder its union, or cripple its subsequent action.

It has been the fashion with many surgeons to surround the sutured nerve with some material supposed to have protective virtues. A piece of a vein—the saphenous, for example—is threaded over the upper cut end of the nerve before suture, and after these ends are approximated the vein is drawn downward and made to surround the line of suture. In other cases a piece of fat dissected from near the wound, or from another part, is wrapped round the nerve, fat being supposed to be capable of insulating the nerve in its new position, or a layer of fascia may be used, or a piece of Cargile membrane. The value of all such methods is open to serious question; it is certain that they are sometimes harmful, it is doubtful if they ever help. They prevent access of blood to the nerve by new channels; they cause adhesions and com-

pression of the nerve, and at times they are discharged from the wound almost unaltered. It is better to avoid such membranes, and to be content with insuring that the nerve is laid along a path of uninjured tissues.

Nerve anastomosis has been tried in a number of cases. The divided ends of a nerve are implanted into the side of a nearlying nerve, the ulnar into the median, for example. This has been done with and without section of the nerve fibers of the intact nerve. All such procedures are worthless, and cannot be too strongly condemned.

Lengthening of the nerve by turning down a strand from the upper divided end, or the bridging of the gap by strands of catgut, are methods with nothing whatever to recommend and everything to discredit them.

In those cases in which the nerve is partly divided, strands of intact fibers still remaining, the severed fibers are united in the same careful way, and the normal strand of the nerve bent upon itself, so as to allow easy approximation of the cut portions of the nerve. In perhaps the majority of operations upon nerves there is no division of fibers, but a length of the nerve is embedded in dense fibrous tissue. These cases give most excellent results. The fibrous tissue which so intimately surrounds the nerve is dissected away little by little. The nerve when first freed is seen to be white and shrunken; but within a few minutes it expands and takes on its normal color.

The functions return usually in the following order: Trophic and vasomotor function; deep sensibility; tactile discrimination and localization; motor power; cotton-wool sensation.

Perfect restoration of function has been most nearly approached in the case of the musculospiral nerve. In other nerves with more complex distribution perfect recovery will depend upon a recognition of the functional localization within the nerve trunk, in addition to the most scrupulous observance of all those technical details without which there will always be something less than perfection.

In the diagnosis and treatment of an organic lesion of a nerve it should never be forgotten that there may be superadded a functional disability. It is advisable at every stage to get rid of the functional in order properly to appreciate the organic. This is particularly important when the organic lesion is well on the way to recovery. Thus, in a recovering lesion of the inner cord of the brachial plexus it may be impossible for the fingers to be flexed until reëducation has trained the laggard muscles into obeying orders from headquarters.

THE INTENSIVE TREATMENT OF SYPHILIS.

STOKES (*Mississippi Valley Medical Journal*, January, 1918) reports from a preliminary survey, still in progress, on 3500 intravenous injections of salvarsan, neosalvarsan, and arsenobenzol, and the accompanying mercurialization, including 6000 intramuscular injections of soluble and insoluble mercurial salts, given in the newly organized Department of Dermatology and Syphilology of the Mayo Clinic, during the past fourteen months.

Intensive antisyphilitic treatment aims at the production of a massive effect on the disease without injury to the patient. In many instances such treatment must be given in a minimum time, to flood the body, so to speak, in order to meet urgent indications arising from the advance of the morbid process. Treatment must be governed in its intensity by the ease or difficulty with which the particular manifestations are known to yield. It must be further governed by the resistance, the tolerance, and the stamina of the patient. It must be preceded by a skilful estimation of the damage already done, the amount of repair likely to be effected, the prospect for cure or permanent arrest offered by various modes of treatment, and a weighing of the risks of treatment for the patient, as against the

risks of the disease. Expert clinical judgment in these matters should increasingly rest, not on guesswork and second sight, but on a carefully thought-out and experimentally controlled rationale.

In developing the course of intensive treatment Stokes followed a well-known European precedent of combining mercurialization with salvarsanization in the same period of time. The salvarsan dosage was reduced somewhat, and a standard interval adopted (one week) between intravenous injections; employing in addition, according to the indications, one of three agents: Inunctions of one-half to one drachm of 50-per-cent metallic mercury in cocoa butter four to six times a week, forty inunctions to the course; soluble mercury salt, mercury succinimide intramuscularly, in one-sixth-grain doses three to five times a week; or insoluble mercurial salt, mercury salicylate, in one-half- to two-and-one-half-grain doses once a week, on an ascending scale. Such doses, he states, conform essentially to what might be called German ideals in the radical treatment of syphilis. The six-weeks' course is necessarily a unit and is repeated at intervals of from one month in early cases to three or more months in late cases.

The intensive combined course finds its best application thus far in the abortive cure of syphilis, in the radical management of secondary syphilis, in early and late syphilis of the nervous system, in many serious involvements of the eye, as in interstitial keratitis, iritis, etc., in syphilis of the stomach, in destructive gummatous osteoarthritis and osteitis, in mutilating syphilis of the nose, pharynx, and larynx, and in general wherever serious damage is imminent and the patient is still in good condition. The treatment must be tempered with common sense on the part of the physician in latent cases, and benign late manifestations, such as cutaneous syphilides, in old people. When damage has been done to important parenchymatous structures, combined salvarsanization and mercurial treatment is less satisfactory, and in marked cardiorenal pathology, and patients with cirrhotic livers and ascites, it is unsatisfactory and even dangerous.

Stokes believes it a conservative rule never to give a single injection of salvarsan except for provocative effect; seldom less than three are given in a late case without contraindications, and never less than six in an early case (primary or secondary).

An empty stomach and restricted diet prevent reactions. A cathartic twenty-four hours after injection prevents toxic absorption of the part of the salvarsan eliminated by the bowel. In case of threatened reactions alkalinize the patient with sodium bicarbonate or Fisher's solution by bowel. The solution of old salvarsan should be slightly alkalinized.

Salvarsan should not be given without mercurial preparation in acute processes other than syphilitic nephritis or syphilis in the abortive stage.

The interval should be tripled and the dose halved after a toxic erythema if the injection is to be repeated, or an exfoliative dermatitis may result. Irritating applications, including mercurial inunctions, should not be used on the skin after a toxic erythema. In acute reactions occurring on the table, and later in incipient cerebral accidents, adrenalin should be used subcutaneously (5 to 10 mm. average dose). Well-compensated hypertension does not contraindicate salvarsan in moderate doses. Salvarsan should not be given to confirmed alcoholics. An injection of salvarsan in a patient who shows well-defined mental symptoms after injection should not be repeated, but a prolonged mercurial course should be substituted. Arsenobenzol (Dermatological Research Laboratories) is fully the equal in therapeutic efficiency of the German old salvarsan and very much superior to it on the score of lower toxicity.

The preliminary survey of the year's results in intensive mercurial treatment has convinced the author that, while salvarsan may give rise to abrupt and immediate complications, mercury is the insidiously dangerous factor in the treatment of syphilis,

especially when used according to modern radical standards. Prolonged mercurialization by intramuscular injection inflicts at first temporary but later cumulative damage on the kidney, and may give rise to a severe and obstinate nephritis, even though the gastrointestinal tract and the mouth show no reactions whatever and the patient makes rapid symptomatic improvement so far as his syphilis is concerned. Stokes's studies seem to support the following tentative conclusions:

Mercurial inunctions may give rise to marked renal irritation in spite of a reputation to the contrary. They are, however, much less apt to do so than soluble or insoluble mercurial salts, intramuscularly. The soluble mercurial salt (succinate) has a distinctly higher therapeutic efficiency than the insoluble, but possibly less effect on the Wassermann reaction in early cases. It is the salt *par excellence* for the therapeutic test and for the treatment of central nervous system syphilis. It exhibits cumulative effects to some extent, and irritation may appear at the end of a first course or be postponed until a later course even though the second be preceded by a rest period. About fifty per cent of patients who received the soluble salt showed some evidence of its effect on the kidney.

Insoluble injections are dangerously cumulative. The storage of the drug in the tissues (fifty per cent in six weeks, according to Schamberg) reduces subsequent therapy to guesswork and at any time serious complications may appear without warning. A single such course may leave so much mercury deposited in the tissues in a problematic state of absorbability that even a mild interim course of inunctions will give rise to a marked nephritis. In the author's experience the insoluble salt is more apt to provoke renal irritation than the soluble. Nearly 70 per cent of the patients receiving insoluble injections showed renal disturbances at some time during the treatment.

The maximum total dosage of mercury salicylate tolerated without renal reaction by the cases thus far included in the survey was thirteen and one-half grains, which is less than the total in the ordinary one-and-one-half-grain, ten-injection course.

Absorption of intramuscularly injected mercury is fully as dependent upon accidents of absorption as upon dosage. Encapsulation, gradually increasing fibrosis in the tissues of the buttock, a wide area of distribution over the fascia lata above the gluteus maximus, trauma to the injection site, etc., distinctly influence the absorption of the drug and its effect upon the kidney.

Different individuals show wide variation in their tolerance of mercury, and it is not possible to definitely predict the degree of individual tolerance before beginning treatment. Age thus far seems to be a factor of minor importance. Fluctuations in individual tolerance during a single course are apparent, influenced possibly by accidents of absorption, dietary errors, etc. Due allowance should be made for spontaneous variations in urinary findings.

The presence of casts in the urine is the most reliable single criterion on which to judge the reaction of the kidney to mercury. The mouth and gastrointestinal tract should not therefore be used by practitioners as evidence of tolerance of the drug, since real damage may be manifest long before the appearance of stomatitis or diarrhea. Any examination of the urine made without a microscopical study of the sediment is worthless. Albumin fluctuates erratically, specific gravity is inconstant in its variations, and only once, even under high dosage, has the author seen hematuria which he believed to be traceable to the effect of mercury.

Stomatitis and gastrointestinal accidents as factors in mercurialization can be practically eliminated by sufficiently rigorous prophylaxis. Avoidance of acid foods, the use of alkaline, astringent, and oxidizing mouth prophylaxis, and the elimination of fruits and coarse vegetables from the diet are the main essentials. Strict regard for these principles has practically done away with such complications.

Those employing intensive methods should be familiar with the overtreatment

syndrome which appears occasionally. It seems to include hyperirritability, extreme nervousness, insomnia, and emotional instability, possibly due to excessive salvarsan, marked loss of weight, weakness, a pinched and withered facial expression with pallor, and indefinite aches and pains with stiffness of the joints. The latter features we interpret as part of the toxic effect of mercury, and Stokes has noticed that they may occur in individuals receiving mercury alone, whose kidneys, mouths, and gastrointestinal tracts show no evidence of the intoxication.

Dealing with resistant late cases, the combined course of treatment is apparently successful in reversing the Wassermann test in approximately 60 per cent. The symptomatic results seem exceptionally good at least thus far in bringing about the arrest of gastric crises, and the control of ataxia, sensory disturbances, and the lightning pains of tabes dorsalis. He has been able to cause the apparent involution of early Charcot joints. Gastric syphilis as such, interstitial keratitis, even of long standing, and vascular lues of the meninges and brain show striking improvement in a single course. Osseous and cutaneous lues, early and late, offer no special difficulties. The results are less satisfactory in spastic and parenchymatous degenerative central nervous changes and in visceral involvement, where the damage done is of course irreparable.

THE STABILITY OF TABLETS CONTAINING HALAZONE.

DUNHAM and DAKIN (*British Medical Journal*, Dec. 15, 1917) observe that halazone tablets prepared from thoroughly dry materials, using sodium chloride with either borax or sodium carbonate and preserved in amber bottles, will maintain their germicidal efficiency at temperatures up to 32° almost unchanged for five months, and should be serviceable for considerably more than a year. Prolonged exposure to temperatures constantly maintained as high as 40° to 50° C. will reduce their efficiency by about one-half in three months.

As to the toxicity of the preparation, they find that rabbits may be fed for many weeks with doses of 100 to 200 mgs. a day without observable symptoms, and that the repeated doses of 500 mg. are without effect. As the quantity needed for the sterilization of a quart of water is only 4 mg., the substance may be regarded as perfectly innocuous.

They have given the name "halazone" to this p-sulphonedichloraminobenzoic acid, and have advised the addition of this preparation to drinking-water the sterility of which is not absolutely assured.

GUNSHOT WOUNDS OF THE LUNGS AND PLEURA.

MOYNIHAN (*Surgery, Gynecology and Obstetrics*, December, 1917) contributes a brief but admirable paper on this subject as follows:

Perfect mechanical cleansing—that is, the excision of all contaminated, infected or dead parts, the removal of all fragments of clothing (by far the most important of all causes of continuing infection in a wound) and of all projectiles—is the supreme necessity in all cases.

In early cases this may allow of immediate closure of the wound, which will be followed by healing in the great majority of cases, say in 80 per cent or perhaps even 90 per cent of those in which there is no loss of tissue.

In infected early cases the mechanical exposure and cleansing may be followed by a treatment directed to the removal of the remaining infection. Physiological and antiseptic methods have each their advocates. The aim of both is to permit of the earliest prudent secondary closure of the wound. In infected late cases, a thorough mechanical exposure and cleansing of the wound and the parts around will allow of secondary closure forthwith if certain antiseptic pastes are used. Experience shows that similar results have followed upon this

mechanical treatment of the wound without the introduction of antiseptics. A further trial in this class of cases may show that the natural defenses of the tissues are ample to deal with the infections then remaining.

It is the natural defensive powers of the body fluids and tissues, of serum and leucocytes, that are the chief agents in finally subduing the bacterial infection in a wound. Sufficient reliance does not appear to be placed upon the stupendous power the body tissues possess for controlling infection.

Finally full emphasis must be laid on the paramount necessity for the complete immobility of wounded parts at all times and on all occasions. So will one of the most powerful agencies making for reinfection and autoinoculation be kept in check.

REVIEWS.

BLOOD TRANSFUSION, HEMORRHAGE, AND THE ANEMIAS. By Bertram M. Bernheim, A.B., M.D. J. B. Lippincott Company, Philadelphia, 1917. Price $4.00.

There are few fields of medical endeavor which have been as interesting to the surgeon and physician as that of transfusion. Hailed at one time with enthusiasm for what it could accomplish it was cast aside shortly afterwards because of failures in technique or because accidents which followed the transfer of blood from one to another have not been understood. Both technique and our knowledge of the physiology of the blood have advanced with such great strides that these difficulties are now overcome, and we are finding in connection with transfusion, as in connection with all other operative procedures, that while complicated apparatus at first glance seems essential, in the end the simplest forms of apparatus give the best results. Although a comparatively young man, Dr. Bernheim has already contributed much to the surgery of the vascular system, and this book is a great enlargement of the chapter in his monograph, Vascular Surgery, which was published five years ago. In his historical note, with which he opens the volume, he gives a brief summary of transfusion from 1492 to date. He is evidently a firm believer in the citrate method rather than in the use of pure blood, although he also seems to be of the opinion that the transfusion or transfer of pure blood by means of the syringe method, as carried out by Lindeman, is also an excellent procedure.

The book is divided into twelve chapters. The first deals with Blood and Phenomenon of Bleeding; the second, Diagnosis of Hemorrhage; the third takes up its control, Factors Involved in a Determination of Danger Limits. This is naturally followed by one giving the Indications for Transfusion, and another dealing with its Dangers. The sixth chapter deals with the Selection of the Donor, Dangers to Donor, and Treatment of Donor after Transfusion. In the seventh chapter he describes various methods of transfusion. The remaining five chapters deal with more definite clinical propositions, such as transfusion for various forms of hemorrhage, accidental or otherwise, as in Gastric Ulcer, Placenta Prævia, and Typhoid Fever. In the ninth chapter he discusses Transfusion for Anemia, with the discussion of dose or quantity of blood which should be transferred, and then follow chapters upon the employment of this method in the treatment of pernicious anemia and for the conditions which depend upon impairment of coagulability of the blood. Last of all we find the use of transfusion in leukemia, in splenic anemia, and in certain toxemias. At the close of each important chapter noteworthy contributions to the subject are given in the form of a bibliography. The book contains a considerable number of illustrations, chiefly showing the various forms of apparatus which are employed, and an appendix giving the various methods by which the clinician or the laboratory worker can study hemolysis and agglutination so as to

be sure that the blood which he transfuses will agree with that of the recipient.

Dr. Bernheim is an enthusiastic advocate of transfusion and yet recognizes its limitations. Without doubt his experience abroad, for he is now in military service on the other side, will give him information which he will be glad to place in the second edition of this book, which we feel confident will be called for as soon as he is ready to prepare it. Just at the present time the profession is so intensely interested in this subject that a volume of this character, presenting a good and practical summary of it, must have a large demand.

AN ACCOUNT OF THE PRINCIPAL WORKS OF THE ATREYA SCHOOL OF MEDICINE, WITH THEIR CHRONOLOGY. Kaviraj Biraja Charan Gupta Kavibhushana. P. S. Gupta, 44 Beadon St., Calcutta, 1917.

The object of the present paper is to lay before the teachers and students of the Ayurvedic literature certain facts which, it is hoped, would throw a considerable light on the subject-matter, and facilitate the teaching and study of the subject. "An attempt has been made here to ascertain the chronology of the more prominent Ayurvedic text-writers and commentators. It is needless to mention here that the chronology of the ancient Hindu medical works is a vexed question, and it is highly desirable in the interests of the Ayurveda that the question should be discussed thoroughly, and the materials for the discussion be collected, assorted, and arranged, in proper order, with a view to settle the points at issue. It is a matter for congratulation that many eminent thinkers, both Eastern and Western, have devoted much time and energy to ascertain the chronology of the Ayurvedic works, and their erudite researches have supplied abundant materials to work upon, and left ample scope for discussion. Besides, many points have been raised and theories have been advanced regarding the chronology. It is high time therefore to take stock of our information on the subject, and test and verify the theories hitherto advanced, from the standpoint of the Hindu sages, and examine whether they can be supported by the internal evidence, and by the learned expositions of the eminent commentators. I need hardly mention, at the outset, that many dubious theories regarding the chronology of the Ayurvedic works have obtained accuracy and received support from the highest quarters, and I think they should be discussed at the bar of scholars, Oriental and Occidental. I should also mention in this connection that the Ayurvedic text-writers and the authoritative commentators should be our guide, and evidence should be obtained from their writings."

"From time out of mind the Indian sages specially conversant with the art of healing have come to be classed under two distinct orders or schools of Hindu Medicine: (I) *Atreya,* and (II) *Dhanwantari.* Some of them who treated diseases such as fever, diarrhea, etc.—*i.e.,* the diseases that can be cured by medicines—were physicians; and others who treated diseases like boils, piles, fistula, etc.—*i.e.,* the diseases to be cured by the application of surgical instruments —were surgeons. Besides these two, there was a class of specialists in the diseases of the eye, ear, nose, head, etc. *Atreya* was the leader of the first class, and hence it was known as the *Atreya* School."

This is a learned discourse on the subject mentioned in the above title. We confess that we are unable to express any opinion concerning it as to its accuracy.

A DIETARY COMPUTER. By Amy Elizabeth Pope. G. P. Putnam's Sons, New York. Price $1.75.

This book of a little over one hundred and fifty pages, made up almost entirely of tables, has been designed by the authoress for nurses and others whose knowledge of dietetics is not very extensive; and, therefore, an endeavor has been made to provide tables that are as practicable and easy of use as possible.

Part one deals with food requirements under different conditions and quotes at length, as is proper, from standard literature dealing with this subject. There is a discussion of the physiological value of

foods, and then follow various menus which may be ordered for patients. The tables are of value in that, after mentioning the article, its size, as well as its weight, is given, as well as its protein, fat and carbohydrate content, with a final statement as to its calories. Thus, opposite the word "mutton chop" it is stated that two chops equal about sixty grammes; 13.02 protein; 17.94 fat; no carbohydrate; and are capable of giving 214 calories. Or, again, that two level teaspoonfuls of granulated sugar weigh about 10 grammes; contain no protein or fat; equal 10 grammes of carbohydrate; and contains 40 calories.

We think that the authoress is modest in intimating that her book will prove useful to nurses. It ought to be exceedingly useful to many doctors.

THE SPLEEN AND ANÆMIA: EXPERIMENTAL AND CLINICAL STUDIES. By Richard M. Pearce, M.D., Sc.D. With the Assistance of Edward B. Krumbhaar, M.D., Ph.D., and Charles H. Frazier, M.D., Sc.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1918. Price $5.00.

As some of our readers know, Dr. Pearce has devoted a large part of his time for a number of years to the study of the relationship between the spleen and the blood. The present volume is a summary of his work and that of his associates, and gives the opinions which they have arrived at in regard to this important subject, which hitherto has been to a large extent an untilled field, or, if not untilled, at least largely barren of results which could be applied by the clinician. Even yet the subjects which are discussed in these pages are not definitely clinical, although they indirectly form foundations for other investigations which doubtless will teach the clinician things that will be advantageous to him in combating the various conditions of anemia which are associated with changes in the spleen. The opening chapter deals naturally with a history of extirpation of the spleen, and this is followed by other chapters dealing with the effect of splenectomy in the dog, concerning supposed regulatory influence of the spleen in blood destruction and regeneration. Other chapters deal with changes in the bone-marrow after splenectomy, as well as with changes in the liver and lymph-nodes after this operation, and with metabolism in man before and after splenectomy.

Part two contains four chapters dealing with clinical observations made by Dr. Krumbhaar in which he classifies and analyzes various types of splenomegaly accompanying anemia, considering methods of value in the diagnosis and prognosis of splenic disease, treatment of splenic disease by methods other than splenectomy, and the value of splenectomy as a therapeutic procedure.

The last chapter, forming part three, by Dr. Frazier, deals with the surgical treatment of lesions of the spleen, and this is followed by a bibliography. This summarization of the contents of the book will give our readers a good idea of its scope and value. It is in every way a most creditable presentation of investigations made in a hitherto obscure field and will doubtless receive much attention from the best part of the profession.

TUMORS OF THE NERVUS ACUSTICUS AND THE SYNDROME OF THE CEREBELLOPONTILE ANGLE. By Harvey Cushing, M.D. Illustrated. W. B. Saunders Company, Philadelphia and London, 1917.

Cushing, on the basis that the time is ripe for special studies of special tumors in special localities, has devoted this monograph to the acoustic neuromas, of which, in his analytical study, he presents the largest number which have heretofore been verified in a single operative clinic.

The opening chapter of this book is introductory and historical. Thereafter follow case reports in adequate clinical detail. There is a chapter on Symptomatology, one upon Pathological Anatomy, one upon Bilateral Tumors and Generalized Neurofibromatosis, one upon Diagnosis, and a final one upon Surgical Treatment; with a bibliography and an index of authors and subjects.

As might be expected of its distinguished

author, he has produced a monograph of permanent value which, whilst taking cognizance of work in the past and giving due credit therefor, has applied to the specific clinical problem methods which have given a measure of success heretofore unattained.

A splendid study and an inspiring example of the highest type of clinical research.

AMERICAN ADDRESSES ON WAR SURGERY. By Sir Berkeley Moynihan, C.B., Temporary Colonel, A.M.S., Consulting Surgeon Northern Command. W. B. Saunders Company, Philadelphia and London, 1917. Price $1.75 net.

These addresses, wisely collected in book form, worded with that supreme skill which Moynihan possesses as a special gift, carry more clearly the great surgical lessons learned in this war than do any other publications. Moynihan states that they represent not only his own views and experience, but those of others and quotes:

> I have gathered a posie of other men's flowers,
> And nothing but the thread that binds them is mine own.

If this be true the thread is a golden one, since each subject he discusses is so briefly, but systematically, set forth that even the casual reader may grasp, and without effort, the prevailing practices of the modern war surgeon. Such papers, which mold surgical thought, or at least crystallize it, must be a part of every educated surgeon's knowledge.

WAR NURSING. A Text-book for the Auxiliary Nurse. By Minnie Goodnow, R.N., War Nurse in France. Illustrated. W. B. Saunders Company, Philadelphia and London, 1917. Price, Cloth, $1.50.

It is to meet the demand for a text-book of nursing as applied to present conditions that the author has prepared the present volume, which is dedicated to all nurses, trained or untrained, of whatever country, who have served their nation in this great war. It is not meant for the graduate nurse, but for the auxiliary or nurse's aid, who has had little instruction, but who wishes to learn the fundamental things which will be of use to her in war service. With this concept in view as to the purposes of the book it can receive none but favorable criticism.

There are chapters devoted to Etiquette and Discipline, and Cleanliness; one, and a most useful one, to Bed Making and Changing; others on Handling and Bathing, Treatments and Diet. It might have been well in this section to accentuate the need of using a soft rectal tube for enemas.

Thereafter follow sections upon Pulse and Temperature, the Observation of Symptoms, Bandages and Surgical Dressings, Wounds, Fractures, Emergencies, and a final brief but well-conceived section upon Anatomy and Physiology.

An excellent book which will assuredly serve a useful purpose.

NOTES AND QUERIES.

NON-BEVERAGE ALCOHOL.

LENGFELD in the *California State Journal of Medicine* for March, 1918, reminds us of the serious and important fact that the Food Conservation Act practically prohibited the distillation of alcohol for beverage purposes after September 9, 1917. The War Revenue Act imposes a higher tax on beverage than on non-beverage alcohol. To carry out these provisions the Treasury Department has issued regulations which affect the physician who uses alcohol for scientific or medicinal purposes. Nobody can buy or sell, obtain or give away, unmodified non-beverage alcohol without first obtaining a permit from the Collector of Internal Revenue. This prohibition is absolute. It applies to the physician and to the physician's prescription. The pharmacist has no discretion in this matter. He is not allowed to sell alcohol unless it first be modified in accordance with one of ten formulæ sent out by the Department. The simplest of these is formaldehyde .4 per cent, or carbolic acid 1 per cent, or mercury bichloride 1/20 per cent. Formaldehyde

has been generally adopted, and most druggists are now sending out alcohol modified by the addition of .4 per cent formaldehyde.

Physicians' prescriptions containing straight alcohol may be filled if there is a sufficient quantity of medicinal ingredient to make the finished mixture unfit for use as a beverage. The prescription mut be *bona fide.* If the physician desires to obtain straight alcohol he can either get a permit from the Collector of Internal Revenue, or he may, at the present time, purchase from a liquor dealer alcohol which was distilled prior to September 9, and on which the higher tax was paid. The supply of such alcohol is extremely limited and will, undoubtedly, be exhaused in a very short time. It is rather more expensive than non-beverage alcohol, and its sale is practically forbidden the pharmacist who holds a permit for non-beverage alcohol. At best, the relief from this source is temporary.

To get a permit the physician must fill out a form of application which he must obtain from the Collector of Internal Revenue, and must file a bond in the sum of approximately $6.00 for each gallon of alcohol he is liable to have in his possession. This bond may be as small as the physician desires, but for ordinary purposes a bond of $50 would be required. This bond may be issued by a surety company, which will charge $5 a year, or it may be a personal bond secured by deposition with the Collector of Internal Revenue of United States bonds for at least $50. A practical way seems to be to deposit a $50 Liberty Bond. The physician will, of course, get the interest on this, and when he surrenders his permit he will have the bond returned to him. There are, perhaps, other ways, but they at present are not practicable.

The permit costs nothing, is good indefinitely, and must be posted somewhere in the physician's office.

Having obtained the permit, the physician can buy non-beverage alcohol by filling out an order blank in triplicate and signing all three copies. One of these will be returned to him to be filed, one sent to the Collector of Internal Revenue, and one kept by the dealer making the sale. The physician will not be allowed to do as he pleases with this alcohol, but must use it entirely for the purpose specified in his application. He cannot use it for household purposes, but probably will be permitted to leave a small quantity with a nurse to be used on a patient if he considers it absolutely necessary. He will probably not be permitted to leave any with a patient unless the nurse acts as his agent, and he will be responsible for the agent.

The layman can purchase beverage alcohol distilled prior to September 9 from his liquor dealer, but when this stock is exhausted there is no way by which the layman can obtain unmodified alcohol excepting that left with the nurse.

There seems to be a question as to whether the use of a small quantity of formaldehyde in alcohol intended for rubbing is injurious. If the medical profession should decide that it is injurious and that there are cases where an alcohol rub is essential, some means should be found by which the physician can prescribe straight non-beverage alcohol, for straight beverage alcohol will soon be entirely off the market. If the medical profession takes this view, there is no doubt but that the Treasury Department will issue regulations to that end. It therefore behooves the various medical societies to thrash out the matter and get a decision.